2022 Southern African Accounting Association National Virtual Conference Proceedings

30 June 2022

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

CONTENTS

PREFACE 3

OBJECTIVE OF THE CONFERENCE. 3

REVIEW PROCESS AND COMMENTS 3

SAAA EXECUTIVE SCIENTIFIC COMMITTEE 3

LIST OF REVIEWERS 4

ACCEPTED PAPER TITLES

An Analysis of the Impact of Board Composition on the Performance of JSE-listed Banks 6

Changes in the Extent of Sustainability Disclosure in Integrated Reports Resulting from the Implementation of King IV..... 43

Reporting on the Sustainable Development Goals: Insights from South Africa 73

Circular Economy Disclosure by JSE Listed Mining Companies in South Africa..... 105

Effect of Board Composition on Capital Structure: Evidence from South Africa..... 134

An Evaluation of Working Capital Practices of South African Firms Before, During and After the 2008 Global Financial Crisis. 170

CEO Appointment Origin and Firm Performance: South African Mining Industry 190

Encouraging a Culture of Tax Compliance for South Africans Owning and Using Crypto Assets. 236

The Use of Artificial Intelligence (AI) to Assist in Identifying Income Tax Evasion in South Africa. 268

Online Learning Behaviour of South African Accountng Students During the Pandemic. 294

PREFACE

Due to the Covid 19 pandemic the 2022 SAAA National Conference was virtually hosted and the papers virtually presented in an online format.

OBJECTIVE OF THE CONFERENCE

The SAAA National Conference aim to contribute towards the achievement of the SAAA vision of promoting excellence in Accountancy Higher Education and Research in Southern Africa. By providing a research and information-sharing platform that focuses on teaching and learning and research in Accountancy, academics can play an active and leading role in Accountancy Higher Education and Research in Southern Africa.

REVIEW PROCESS AND COMMENTS

All papers submitted for the 'refereed category' were subjected to a rigorous process of blind peer review. All the papers were submitted to at least two experts at an independent South African University for double blind peer review. Comments and suggested amendments from the reviewers were communicated to the authors and the reviewers decided on the acceptance of the papers for presentation at the conference and inclusion in the conference proceedings. Experts also rejected certain papers and these were not included in these conference proceedings. The accepted papers were contributed by academics representing a number of universities.

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ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

An Analysis of the Impact of Board Composition on the Performance of JSE-listed Banks

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ABSTRACT

Governance of the banking sector became subject to substantial scrutiny over the past two decades. Although numerous international studies have been conducted to determine the composition of a company's board and how it impacts its governance structures and financial performance, it is evident from the current body of knowledge that scope for additional research in specifically the banking sector, prevails. Furthermore, a gap in the research from a South African perspective in this field is highlighted, as most studies, if not all, have been conducted elsewhere. These studies also primarily focused on developed countries, while relatively little is known about the corporate governance and its role in the banking sector of emerging countries, such as South Africa. This paper aims to start filling the gap from a South African perspective by determining whether the board composition of South African Johannesburg Securities Exchange (JSE)-listed banks has an impact on, or correlate with, such banks' financial performance. The research conducted is in this paper is positioned within the positivistic research paradigm and follows a quantitative research approach by analysing secondary data obtained from a sample of banks listed on the JSE. Findings showed that some board composition variables such as board size, gender diversity and independence does have an impact on some of the financial performance ratios used to measure the financial performance of some of the banks listed on the JSE.

KEYWORDS

Bank performance; board characteristics; board committees; board composition; board independence; board size; board structure; corporate governance.

INTRODUCTION

Corporate Governance (CG) within the global banking sector had been under scrutiny in recent years (Bawaneh, 2020; Christofi, Christofi & Sisaye, 2012). This is mostly due to various financial crises such as the subprime mortgage crisis that occurred in 2007, which resulted in the credit crunch that manifested itself in 2008 (Adams & Mehran, 2012; IoDSA, 2009). It is argued that the financial sector of South Africa was also negatively affected by the international financial crisis, despite the implementation of various legislative and other governance frameworks (Kohler & Saville, 2011). These legislative frameworks include the implementation of: (i); the Financial Intelligence Centre Act 38 of 2001 (FICA), which came into effect in 2001 (Banking Association of South Africa, 2013); (ii) the National Credit Act 34 of 2005 in 2006; and (iii) the new Companies Act No.71 of 2008, which became effective in April 2011 (CIPC, 2011). As a result of these legislative requirements, and the various financial crises experienced, the CG framework applied in South Africa was renovated and, consequently, the well-known King reports were introduced and developed over time in South Africa (IoDSA, 2009:8).

In 1992, the King Committee on Corporate Governance was formed in South Africa and considered CG from a South African perspective (SAICA, 2008). The result was the first King report (King I) in 1994, which marked the institutionalisation of CG in South Africa (SAICA, 2008). King I aimed to promote CG in South Africa and established recommended standards of conduct for boards and directors of listed companies, banks and certain state-owned enterprises (SAICA, 2008). King I advocated an integrated approach to good governance, taking into account stakeholders' interests and encouraging the practise of good financial, social, ethical and environmental practices (SAICA, 2008). During 2002, the second King report (King II) on corporate governance was published. It contained a code of corporate practices and conduct. Although voluntary, the Johannesburg Securities Exchange (JSE) Limited has requested listed companies to comply with the King report's recommendations or to explain their level of non-compliance, thereby following a *comply or explain* approach (SAICA, 2008). The revised Code of and Report on Governance Principles for South Africa (King III) was released on 1 September 2009, with an effective date of 1 March 2010 (SAICA, 2008).

ISBN NUMBER: 978-0-620-99843-7

The updated King III report was not only introduced as a result of the new South African Companies Act (71 of 2008), but also to keep up with the global developments and trends in CG practices (SAICA, 2008). It was, therefore, necessary to issue the new King III version as an update from its two predecessor reports (IoDSA, 2009:8). With the introduction of the new King III report on CG in South Africa, it was noted that amendments were made concerning the requirements in terms of board structure and board composition (SAICA, 2008). These amendments included the composition requirements such as independent versus executive board members as well as requirements in connection with the chairperson of the board etc. (SAICA, 2008).

With most recent developments, the fourth King report (King IV) had now completely replaced King III on 1 November 2016 (IoDSA, 2016:11), and came into immediate effect for all financial years on or after 1 April 2017. King IV now defines CG as: *"…the exercise of ethical leadership by the governing body towards the achievement of the following governance outcomes: Ethical culture, Good performance, Effective control and Legitimacy"* (IoDSA, 2016:11).

Despite having all the above codes that provide detailed guidelines in connection with proper CG practices, Odendaal and De Jager (2008) argue that South Africa has had quite a number of non-compliance instances to CG, which have contributed to corporate failures, such as LeisureNet, Saambou, Fidentia and most recently, Steinhoff, VBS Bank and African Bank. The Steinhoff saga is possibly viewed as one of the largest corporate fraud cases in the history of South Africa, and the most renowned question posed with regard to this saga is, "*Where was the board?*" (Naudé, Hamilton, Ungerer, Malan & De Klerk, 2018).

According to Naudé *et al*. (2018), CG focuses on a system that needs to be in place to give guidance on how a company should be run. Having a close look at Steinhoff's misfortune, what needed to be investigated was the compliance or non-compliance to CG. In addition, the composition and structure of the board also needed to be considered, as it is argued that it was a contributing factor to the said failures (Naudé *et al*., 2018).

Looking more specifically at the South African banking sector, African Bank Investment Limited (ABIL) was not without its CG issues. The fact that unsecured loans were ABIL's

ISBN NUMBER: 978-0-620-99843-7

sole source of income and the 2017 acquisition of Ellerines, were the two main reasons for the failure of ABIL. However, although the former mentioned two reasons were advocated to be the main reasons for ABILs collapse, the Myburgh commission of enquiry faulted the board and held the board of ABIL accountable for substandard supervision over the bank by indicating that the board should have held the bank to the highest standard of care (Carrim, 2016).

The proper implementation of the principles contained in the King reports could assist in the possible prevention of corporate failures as indicated above. Therefore, it is evident that most organisations, and particularly banks, could be lacking the accurate application of CG principles and variables that result in poor financial performance (Modiha, 2018). Despite the fact that many fingers have been pointed at the auditors for corporate failures of the past, as have been noted from the above literature, the auditors cannot guarantee the successful or profitable running of any client (in this case, banks). Hence, the responsibility of good CG and management of banks lies in the hands of management, and most importantly, the bank's board of directors.

Therefore, it is questionable whether or not CG requirements and variables about board compositions, structure and characteristics will influence and impact the financial performance of a company, and more specifically, the banking sector in South Africa. This paper therefore attempted to analyse the impact of board composition on the performance of JSE-listed Banks as it seems from the above literature that board composition may impact financial performance in general. Research in this field in South Africa is also limited. The findings of this study should therefore be of value to the banking industry specifically within a South African context. The study will also add to the exiting body if international literature in this field of study.

RESEARCH QUESTION, HYPOTHESIS AND OBJECTIVES

Deduced from the introductory discussion of this paper, it can de deduced that there is little consensus on whether or not board structure has an impact on the performance of the banking sector.

ISBN NUMBER: 978-0-620-99843-7

The lack of literature within a South African Banking Sector context further argues that the proposed research in this area is necessary and will contribute to the robustness of the current body of knowledge available in the international research field of the banking sector. Therefore, this research paper aims to fill these knowledge gaps identified above and to contribute to the robust research on corporate governance globally.

Hence, this paper endeavours to answer the following formulated research question:

Does the board composition of South African JSE-listed banks have an impact on, or correlate with, such banks' financial performance of banks?

Also, the paper aims to test the following hypothesis:

H_0: *The current composition of boards impacts the financial performance of South African banks listed on the JSE.*

To answer the research question and test the hypothesis, the paper addresses the following primary research objective (PO):

PO: *To analyse the impact of board composition on JSE-listed banks' performance and to recommend best practices in board structure and other board-related practices for optimal financial performance of JSE-listed banks in South Africa.*

To address the PO, the paper also aims to achieve the following secondary research objectives (SOs):

SO_1: *To conceptualise and identify the recommended board composition variables from the literature that affect financial performance;*

SO_2: *To define financial performance in the banking sector and to identify from the literature the key financial ratios used by banks to evaluate financial performance;*

SO_3: *To determine whether selected board composition variables correlate with the financial performance of banks; and*

SO_4: *To recommend (where applicable and appropriate) some possible best practice principles on board composition to banks based on the results of this paper.*

The remainder of this research paper is structured as follows: First, a review of literature is performed to conceptualise and identify the recommended board composition variables and

ISBN NUMBER: 978-0-620-99843-7

other best practices, as deduced from the current body of knowledge that might affect financial performance of corporate entities in general. This is followed by a specific focus on literature relating to the financial performance of the banking sector and the identification of the key financial ratios used by banks to evaluate their financial performance. Hereafter, a description and motivation for the research methodological elements applied in this paper are provided that were employed to conduct the analysis in order to determine the possible impact of board composition criteria and its correlation with the financial performance of JSE-listed banks. Finally, the findings of the analysis are reported on and conclusions are drawn in the context of each the formulated research objectives to prove/disprove the hypothesis and to answer the paper's overall research question. In addition, possible recommendations regarding best practices and/or principles on board composition of banks based on the results of this paper are made, the limitations of the analysis conducted are acknowledged, and possible suggestions for further research are made.

LITERATURE REVIEW

Conceptualising and identifying recommended board composition variables that affect financial performance in general

In order to identify the recommended board composition variables that affects financial performance of corporates in general, the term "corporate governance" (CG) first needs to be conceptualised (particularly within the South African context) as well as the variables that affect it (this will address SO_1). The literature review therefore firstly provided a broader scope of financial performance of corporates in general after which it is narrowed down to bank specifically.

Conceptualising CG

CG has been defined as: "*dealing with the ways in which suppliers of finance to corporations assures themselves of getting a return on their investment*" (Shleifer & Vishny, 1997:737).

ISBN NUMBER: 978-0-620-99843-7

The Institute of Directors in South Africa (IoDSA) indicates that the aim of CG is to put in place a set of guidelines that align, as nearly as possible, the interests of individuals, corporations and society (IoDSA, 2002). Furthermore, the Organisation for Economic Cooperation and Development (OECD) describes it as the system by which business corporations are governed and administered (OECD, 2004). Meyer and De Wet (2013:19) defines CG as "*the system of principles, policies, procedures, and clearly defined responsibilities and accountabilities used by stakeholders to overcome conflicts of interest inherent in the corporate form*".

In a report issued by the IoDSA, CG is defined as: "*the exercise of ethical and effective leadership by the governing body towards the achievement of ethical culture, good performance, effective control, and legitimacy*" (IoDSA, 2016:11). The aforementioned report states that the concept CG refers to entities that are consolidated, forming legal separate entities (IoDSA, 2016:11). This is done to differentiate it from other forms of government. Moreover, this applies to all forms of amalgamations such as banks (IoDSA, 2016:11).

The concept of CG has long been known and implanted in South Africa in terms of the King I, II, III and currently the latest King IV reports (IoDSA, 2002; 2009; 2016). The King reports, as well as their legislative developments, aim to enhance CG standards in South Africa and to align them with international best practices (Louw, 2002). Mashwama (2015:24) explains that the board of directors are responsible for CG with the functions of directing and controlling the company. Therefore, CG represents the means by which direction and control are applied to the management of an organisation's assets, both tangible and intangible, financial and non-financial, in the pursuit and delivery of the primary objectives of sustainable value creation (Bawaneh & Badran, 2013; Mashwama, 2015). Meyer and De Wet (2013) highlight that a company's board structure consists mainly of the following variables: board composition; board ownership; and board size. For South Africa, CG guidelines such as the King IV report, require boards to comprise a majority of non-executive directors, of whom the majority should be independent (KPMG, 2009; Meyer & De Wet, 2013).

ISBN NUMBER: 978-0-620-99843-7

According to Meyer and De Wet (2013), the incidents of major corporate scandals, such as Enron and WorldCom in America and Regal Bank and LeisureNet in South Africa, have brought much attention to CG issues and regulation aimed at improving the CG environment. In theory, by choosing to comply with a code of good CG practices and recommendations, a bank will signal to investors that it is well governed, meaning that management will handle their investments responsibly, and by implication operate in the interests of shareholders (Tshipa, 2013). Hermalin and Weisbach (1998) discovered that the one important criterion to ensure the success of the board of directors as managers of a legal entity is through an effective board structure. The next section identifies and elaborates on different board structure variables.

Board composition variables

Board composition is a measure of the proportion of independent non-executive directors to the total number of directors in a company (Meyer & De Wet, 2013; Uadiale, 2010). The board should comprise of a balance of executive and non-executive directors, out of whom the majority must be non-executives who need to be independent of management to protect shareholders' interests (Fokazi, 2008). Petra (2005) suggests that organisations need to structure their boards in such a manner that it will serve the needs of the entity. Therefore, it needs to be considered if the board composition will enable the diverse perspectives, skills-set and abilities that are required to successful steer and manage a corporate entity in a specific type of business environment or industry (such as the banking sector) (Petra, 2005). Tshipa (2013) highlights that the size of the board is one of the most important board structure variables. Furthermore, Uadiale (2010) indicate that large board structures prove to contribute towards and support diversity. Good CG is brought about by individuals with a diverse mix of backgrounds and qualifications with knowledge and expertise in various areas such as business, finance, accounting, marketing, public policy, manufacturing and operations, government, technology, and other areas that a board may deem desirable (Petra, 2005).

The board members of an entity are responsible for the executive management and leadership which need to guide and align operations with the entity's overall strategy (i.e. vision and mission) (Fokazi, 2008; IoDSA, 2016).

ISBN NUMBER: 978-0-620-99843-7

Therefore, it is evident that an organisation's board's composition is an important element which plays a pivotal role in ensuring that a corporate entity accomplishes its objectives (IoDSA, 2016). The effectiveness of a board could be influenced by numerous factors such as the board size, knowledge and qualifications of board members and board members' abilities and skills (IoDSA, 2016).

In terms of the IoDSA (2016), the full disclosure of an entity's board composition variables, such as skills, race, gender and qualifications, are recommended to be disclosed in an entities' annual integrated report. It is furthermore advocated that the board of directors should holistically reflect diversity in terms of age, skills, gender and race across the organisation. In terms of gender, Mashwama (2015) emphasises that boards could benefit significantly from including the special skills and expertise that women could bring to the table. Scholtz and Kieviet (2018) found that the proportion of women on a board, the number of directors with a business qualification and board size are significantly positively related with the performance of companies in South African, while ethnic diversity of a board is significantly negatively related with the performance of companies in South Africa. Having diversity in the board composition, specifically in terms of gender and board independence, is imperative for compliance to recommended CG practices, which, in turn, has proven to support sustainability performance and long-term success (Nakeng, 2019).

In terms of the King IV report (IoDSA, 2016:13), *independence* is defined as: *"the exercise of objective, unfettered judgement*". When used as the measure by which to judge the appearance of independence, or to categorise a non-executive member of the governing body or its committees as independent, it means the absence of an interest, position, association or relationship that, when judged from the perspective of a reasonable and informed third party, is likely to influence unduly or cause bias in decision-making. As early as the 1980's, Baysinger and Butler (1985) suggest that a favourable board contains a mix of internal, independent, and affiliated directors, that brings different skills and knowledge to the table in support of better management and overall governance.

ISBN NUMBER: 978-0-620-99843-7

Drawn from the aforementioned discussion, it is evident that there are various variables in the term “board composition” that could be analysed within a CG context to determine its association with financial performance ratios. For purposes of this paper, the following three variables will be analysed against financial performance indicators, namely: (i) *board size*; (ii) *gender*; and (iii) *independence*. The next section elaborates on the relationship between CG and financial performance in general.

Relationship between financial performance and CG variables in the banking sector

International literature about the corporate governance of banks indicates that governance in this sector has obtained substantial attention over the past few years, specifically in the last decade. These international studies focused on the effects that several variables of board structure have on the financial performance of banks in most *developed* countries globally. These variables include: (i) board size; (ii) the ratio of independent versus executive directors; and (iii) gender representation.

De Andres and Vallelado (2008) investigated whether there is any correlation between bank performance and board size, and between the proportion of a board’s non-executive versus executive composition and performance. Their findings indicate that board composition and board size do affect the financial performance of banks. Hereafter Cornett, McNutt and Tehranian (2009) explored whether CG mechanisms such as CEO pay-for-performance sensitivity (PPS), board independence and capital have an effect on earnings and earnings management in respect of the largest publicly traded bank holding companies in the United States of America (USA). They established that PPS, board independence and financial capital all positively correlated with earnings, and that earnings, board independence and capital all negatively correlated with earnings management. Their findings further indicated that PPS is positively correlated with earnings management (Cornett *et al.,* 2009). Adams and Mehran (2012) addressed a long-standing gap in the literature by studying the association between board governance and performance using a sample of publicly-traded bank holding companies in the USA extending over a period of 34 years. The results of latter study indicated that board independence is not related to performance, but that board size is positively related to performance (Adams & Mehran, 2012).

ISBN NUMBER: 978-0-620-99843-7

Pathan and Faff (2013) analysed whether the variables of board structure such as board size, independence and gender diversity have any impact on the financial performance of banks. The sample population included a broad panel of large USA bank holding companies over the period from 1997 to 2011 and they concluded that both board size and the existence of independent directors do decrease bank performance, whereas gender diversity improves bank performance in the pre-Sarbanes-Oxley Act (SOX) period (i.e. 1997 to 2002). However, this positive effect of gender was found to weaken during both the post-SOX (i.e. 2003 to 2006) and the crisis periods (i.e. 2007 to 2011).

Another study performed by Liang, Xu and Jiraporn (2013) determined the effect of board characteristics of banks in China. In this study, Liang *et al.* (2013) used 50 of the largest banks in China during the time period 2003 to 2010 and investigated the effect of board structure variables such as size, composition and functioning of the board on the financial performance and the asset quality of these banks. Their findings concluded that the number of board meetings and the proportion of independent directors to dependent directors have a significant positive impact on both the asset quality and financial performance of the banks analysed in the study. Furthermore, they found that board size has a significantly negative impact on bank performance (Liang *et al.,* 2013).

Waqar, Rashid and Jadoon (2014) aimed to investigate the relationship of variables such as board size and board independence to bank profitability and efficiency of 23 banks listed on the Karachi Stock Exchange in Pakistan. This was done by analysing these banks' annual reports over a five-year period ending 2010 (Waqar *et al.,* 2014). The results of this study indicated that board independence had a positive effect on the profitability and efficiency of the banks under scrutiny. Furthermore, their findings showed that no positive correlation exists between board size and the profitability and efficiency of such banks in Pakistan (Waqar *et al.,* 2014). In addition, a study by Madhani (2015) focused on the relationship between the board committees and CG practices of Indians firms. This study highlighted that the board committees as internal CG mechanism were fundamental and played a crucial role in overall board performance and effectiveness (Madhani, 2015).

More recently, a study conducted in Jordan (Bawaneh, 2020) attests to similar variables indicated in the preceding paragraphs. The said study focused on whether there was a

ISBN NUMBER: 978-0-620-99843-7

significant relationship between CG variables such as the board composition and the financial performance of the financial institutions (Bawaneh, 2020:55). The study revealed that to understand the impact of CG on the company's performance, it was crucial to first examine the relationship between CG variables such as board size, number of independent directors, chairperson duality and number of board meetings, and financial performance variables such as return on assets (ROA), earnings per share (EPS), and return on investment of financial institutions within the Jordanian context (Bawaneh, 2020).

Finally, a study conducted by Moope (2020) on the influence of board demographic factors on company performance argued that those demographics do affect the financial performance of a broad range of companies. Statistically, there is a negative effect on the financial performance of South African companies, showing a clear relationship between demographics and performance (Moope, 2020).

From the above, it is noted that there is a lack of consensus between research results on the impact of CG practices, specifically in respect of the number of board members and board independence, and gender diversity in the banking sector. While some studies such as De Andres and Vallelado (2008) and Adams and Mehran (2012) concluded that board size does impact the financial performance of banks, other studies, including Waqar *et al.* (2014), noted the contrary. The same could be said for the ratio of independent versus executive directors, as studies such as Mehran (2012) and Pathan and Faff (2013) reported contrasting results. Even more recent research conducted by Moope (2020) and Bawaneh (2020) showed to have opposing views. Therefore, it is clear that further research in this field is necessary to start narrowing the gap between these various views currently circulating in the literature.

Financial performance in the banking sector: Identifying key financial ratios used by banks to evaluate financial performance

Financial performance could be measured in various ways and manners. The financial performance, used as measuring instrument to evaluate the existence and sustainability of any entity, is important to any entity's shareholders as well as its stakeholders in general. It is therefore imperative for any entity (including banks) to ensure that their financial performance is effective.

ISBN NUMBER: 978-0-620-99843-7

Müller (2014) highlights that because financial performance is the key source for financing economic activities, it is crucial to identify and analyse factors that influence financial performance. In ensuring this, the managerial abilities of the board of directors as well as their composition are of utmost importance in the financial performance of all sectors (Müller, 2014). However, uncertainty still prevails on whether certain board composition characteristics do significantly influence a bank's performance. Although limited studies have been conducted to determine the latter within the banking sector, various studies have been performed over the past decade aimed at testing the influence that board composition might have on the financial performance of entities in general. International studies (including studies in the United States of America, the United Kingdom, Germany, Malawi and Brazil amongst others) have substantiated the positive relationship between good CG and organisational performance (Mashwama, 2015; Modiha, 2018).

Bhagat and Black (2000) found that the composition of boards of directors of American public companies mostly comprised of independent directors. Furthermore, they reported that companies with poor profitability respond to this by increasing the independence of their board of directors. However, they also highlight that by improving board independence did not result in increased performance (Bhagat & Black, 2000).

Brown and Caylor (2004), as well as Gompers, Ishii and Metrick (2003) reported that companies with effective CG systems tend to have satisfactory measures of profitability and generate higher returns for shareholders. Abdullah (2004) investigated the following financial ratios: return on assets (ROA); return on equity (ROE); earnings per share (EPS) and profit margin, to determine the impact of board independence and CEO duality on an organisation's financial performance. Findings showed that neither board independence, leadership structure, nor the joint effects of these two showed any relations with an organisation's financial performance (Abdullah, 2004).

In a study conducted by Tornyeva and Wereko (2012), the correlation between CG and the financial performance of insurance companies in Ghana was investigated and showed that variables such as large board size; board skills; management skills; longer serving CEOs; size of the audit committee; audit committee independence; foreign ownership; institutional

ISBN NUMBER: 978-0-620-99843-7

ownership; dividend policy; and annual general meetings are positively correlated with the financial performance of insurance companies in Ghana.

RESEARCH METHODOLOGY

Research paradigm and approach

The research conducted in this paper is positioned within the positivistic research paradigm. *Positivism* is based on the ontological foundation that the world is viewed objectively and apart from the researcher (McKerchar, 2008:7) and its epistemological views. The positivist philosophical approach assumes that assurance of validity could be accepted once knowledge is created based on research performed by way of rigorous methods of data within controlled conditions that are associated with quantitative approaches of conducting research (Thompson, 2015; Zuber-Skerritt, 2001). Consequently, this paper employed a quantitative research approach whereby numerical data was gathered and statistically analysed in proving or disproving the paper's formulated hypothesis.

Target population and sampling

Blumberg, Cooper and Schindler (2005:228) defines a target population as the sum collection of the elements from which the researcher attempts to investigate. The target population under scrutiny in this paper comprised all South African banks listed on the JSE (nine in total) for five-year time period from 2015 to 2019. The starting point of 2015 was used as the new recommendations of the King IV report, which came into effect on 1 April 2017. The study does not include any 2020 figures, as the 2020 figures would have been affected by the Covid-19 pandemic and may skew the results and/or interpretation of the results of this study. Non-probability sampling is characterised by the fact that the target population will not have a same opportunity to form part of the sample selection (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014).

However, the latter results in the findings not to be generalised in terms of the larger target population (Kumar, 2014). Convenience sampling is one of the sampling techniques resonating under non-probability sampling which is unrestricted in nature and mostly applied in exploratory type of research studies (Blumberg *et al.*, 2005; McMillan & Schumacher, 2010).

ISBN NUMBER: 978-0-620-99843-7

Non-probability sampling, was applied and the three major banks listed on the JSE with the highest market capitalisation (African Markets, 2020) were selected as the sample and study population. The latter sample is therefore regarded sufficient for the purpose of what this paper aims to achieve. To uphold the principles of conducting research in an ethical manner, the three selected banks are anonymously referred to in this paper as Bank A, Bank B and Bank C.

Data collection

Data to be analysed was obtained and collected from the annual financial reports of the JSE-listed banks included in the sample (i.e. Bank A, Bank B and Bank C). A content analysis was performed on these annual financial reports to obtain information (both independent and dependant variables) for each of the selected banks for the period 2015 to 2019 as indicated in Table 1 below:

Table 1: Independent and dependant variables

Independent variables	***Dependant variables (financial ratios)***
• Board size; • Gender; and • Independence.	• Return on equity; • Total dividends per ordinary share (cents); • Total dividends per ordinary share growth (%); • Headline earnings per share (cents); • Headline earnings (R 'million); • Cost to income (%); and • Revenue growth (%).

(Source: Researchers' compilation)

In an attempt to ensure comparative data, data from the 2020 and 2021 financial years was excluded from the data selection to try and prevent possible data distortion affected by the COVID-19 pandemic which hit South Africa during March 2020 (Diseases, 2020; South Africa, 2020). Through a quantitative data analysis, scores were statistically analysed by coding data and capturing it on an MS Excel spreadsheet in accordance with the independent variables (i.e. board size, gender and board independency).

ISBN NUMBER: 978-0-620-99843-7

Research methods

Content analysis

Steps followed for the content analysis coincided with the process suggested by Du Plooy-Cilliers *et al.* (2014:171), namely: First, the researchers collected and analysed data by writing notes and reading them carefully on the composition of the board and the financial performance ratios for each year for the period 2015 to 2019. Different types of themes were listed as they emerged from analysing the information gathered from the annual integrated reports of all three the sampled banks over the five-year period. Hereafter, each item was categorised in a manner that described the concept for both independent variables (i.e. (i) *board size*; (ii) *gender*; and (iii) *board independence*), as well as for dependant variables (i.e. *financial ratios*). Next, data was coded in terms of its meaning for both independent and dependant variables to be operationalised within the context for further analysis. The latter was followed by placing them in a particular category as identified. Categories were then grouped according to both main headings and sub-headings, followed by a content analysis conducted by the first researcher. In addition, a second researcher reviewed the analysis to confirm the precision and non-biased nature of the gathered information.

Hierarchical linear modelling

Hierarchical linear modelling (HLM) (Hancock & Mueller, 2010; Huta, 2014), with the use of the SAS statistical software package (IBM SPSS Statistics Version 27, 2020), was applied in this paper as the research analysis method in order to determine whether changes in the board composition variables (i.e. independent variables) correlate with the financial performance of banks (i.e. dependent variables), over the five-year period (i.e. 2015 to 2019).

HLM is essentially an enlarged form of regression and is beneficial for comprehending relationships in hierarchical data structures (Huta, 2014; Sullivan, Dukes & Losina, 1999). According to Huta (2014), HLM can be applied where observed outcomes need to be made from groups of data that are randomly selected. Therefore, HLM is deemed to be appropriate for application in this paper.

ISBN NUMBER: 978-0-620-99843-7

Validity and reliability

The researchers took special care to ensure that the integrity of data is not compromised by way of any exclusion or error while collecting, processing and interpreting the data. All the data obtained was included in the data analysis. Furthermore, the quantitative data analysis was performed in an independent manner with the assistance of a professional and qualified statistician by using the SAS statistical software package (IBM SPSS Statistics Version 27, 2020).

In this paper, the changes in various board composition variables over various time periods are compared to the exchange in various financial performance ratios over the exact period of time. Therefore, this paper used specified groups of data over specified time periods, which were selected at random. The HLM model used was also tested for goodness of fit, and it was confirmed that the r^2 ranged between 0.01 and 0.25 in most instances (Ellis & Steyn, 2003). This is required to ensure that the results obtained are valid and reliable (Ellis & Steyn, 2003).

EMPERICAL DATA, ANALYSIS AND RESULTS

As formerly mentioned, secondary data was collected from the annual integrated reports of Bank A, Bank B and Bank C, respectively for each of the variables (both independent and dependent in nature) as identified under the literature review section for further analysis and interpretation. This secondary data is presented next (separately for independent and dependent variables), followed by a presentation and interpretation of the statistical analysis performed to determine whether the board composition elements correlates with the financial performance of banks.

Presentation of data collected for further analysis

Independent variables

The independent variables identified by the performance of the literature review, include: (i) *board size*; (ii) *gender;* and (iii) *independence*.

Table 2 to Table 4 illustrate the findings of the data collected in connection with the board composition variables for each of the financial years under review. It also illustrates the

ISBN NUMBER: 978-0-620-99843-7

percentage change year-on-year for each of the variables for each of the banks included in the sample.

Table 2: Board composition variables: Bank A

	BANK A										
	Board characteristics: Board composition										
	Board size		Gender				Board independence				
		% change	F	M	% F	% change	INED	NED	ED	% of independence	% change
2015	13		2	11	15%		10	0	3	76%	
2016	20	35%	5	15	25%	62.50%	14	3	3	70%	-9%
2017	18	-11%	4	14	22%	-11.11%	11	4	3	61%	-13%
2018	16	-13%	4	12	25%	12.50%	12	2	2	75%	23%
2019	18	11%	7	11	39%	55.56%	13	3	2	72%	-4%

F Female
M Male
INED Independent non-executive director
NED Non-executive director
ED Executive director

From Table 2 above, it can be seen that the board size of Bank A in 2015 amounted to 13 members, after which it remained constant between 16 and 20 members. There was therefore an increase/decrease in board size year-on-year. The board also consisted mainly of male board members, although the female representation increased over the years under review.

From an independence perspective, the independence of board members initially decreased from 2015 to 2017, after which it increased again to 75% in 2018. The latter, however, decreased again in 2019.

ISBN NUMBER: 978-0-620-99843-7

Table 3: Board composition variables: Bank B

	BANK B										
	Board characteristics: Board composition										
	Board size		Gender				Board independence				
		% change	F	M	% F	% change	INED	NED	ED	% of independence	% change
2015	21		4	17	18%		11	7	3	52%	
2016	21	0%	4	17	19%	6%	11	7	3	52%	0%
2017	20	-5%	5	15	25%	31%	11	6	3	55%	5%
2018	16	-25%	6	10	38%	50%	7	6	3	44%	-20%
2019	18	11%	6	12	33%	-11%	11	4	3	61%	40%

F Female
M Male
INED Independent non-executive director
NED Non-executive director
ED Executive director

From Table 3 above, it can be seen that the board size of Bank B in 2015 amounted to 21 members and remained fairly constant until 2017, after which it decreased. The board also consisted mainly of male board members, although the female representation increased over the years under review. From an independence perspective, the independence of board members initially increased from 2015 to 2017, after which it decreased to 44% in 2018. The latter, however, increased again in 2019. From the latter, it seems as if Bank B, compared to Bank A, showed greater improvements in board representation variables over the five-year period under review.

ISBN NUMBER: 978-0-620-99843-7

Table 4: Board composition variables: Bank C

	BANK C										
	Board characteristics: Board composition										
	Board size		Gender				Board independence				
		% change	F	M	% F	% change	INED	NED	ED	% of independence	% change
2015	14		3	11	21%		9	3	2	64%	
2016	17	18%	4	13	24%	10%	10	3	4	59%	-8%
2017	18	6%	5	13	28%	18%	13	1	4	72%	23%
2018	14	-29%	4	10	29%	3%	10	1	3	71%	-1%
2019	16	13%	4	12	25%	-13%	12	1	3	75%	5%

F Female
M Male
INED Independent non-executive director
NED Non-executive director
ED Executive director

From Table 4 above, it can be seen that the board size of Bank C in 2015 amounted to 14 members and increased in size until 2017, after which it decreased. The board also consisted mainly of male board members, with little improvement in this category over the years under review. From an independence perspective, the independence of board members initially decreased from 2015 to 2016, after which it decreased to 72% in 2017, and ended up at 75% for 2019. From the latter, it seems as if Bank C, compared to Bank A and Bank B, has a smaller board and less female representation. It does, however, compare well in connection with the number of independent non-executive directors as a percentage of the total board members.

The next section highlights the dependent variables and the data collected for each of the banks included in the sample.

ISBN NUMBER: 978-0-620-99843-7

Dependant variables

The dependent financial performance variables identified by the performance of the literature review, include: (i) *return on equity*; (ii) *total dividends per ordinary share*; (iii) total dividends per ordinary share growth; (iv) headline earnings per share; (v) headline earnings; and (vi) cost to income. Table 5 to Table 11 illustrate the findings of the data collected in connection with the board composition variables for each year under review. It also illustrates the percentage change year-on-year for each of the variables for each of the banks included in the sample.

Table 5: Return on equity (%): Bank A to Bank C

Return on equity (%)						
Year	**Bank A**		**Bank B**		**Bank C**	
	Ratio	**% change**	**Ratio**	**% change**	**Ratio**	**% change**
2015	15.6		24.7		17	
2016	15.3	-1.92%	24	-2.83%	16.6	-2.35%
2017	17.1	11.76%	23.4	-2.50%	16.4	-1.20%
2018	18	5.26%	23	-1.71%	16.8	2.44%
2019	16.8	-6.67%	22.8	-0.87%	15.8	-5.95%

Table 6: Total dividends per ordinary share (c): Bank A to Bank C

Total dividends per ordinary share (c)						
Year	**Bank A**		**Bank B**		**Bank C**	
	Ratio	**% change**	**Ratio**	**% change**	**Ratio**	**% change**
2015	670		2100		999	
2016	780	16.42%	2260	7.62%	1030	3.10%
2017	910	16.67%	2550	12.83%	1070	3.88%
2018	970	6.59%	2750	7.84%	1110	3.74%
2019	994	2.47%	2920	6.18%	1125	1.35%

ISBN NUMBER: 978-0-620-99843-7

Table 7: Total dividends per ordinary share growth (%): Bank A to Bank C

Total dividends per ordinary share growth (%)						
Year	Bank A		Bank B		Bank C	
	Ratio	% change	Ratio	% change	Ratio	% change
2015	13		10		8	
2016	16	23.08%	8	-20.00%	3	-62.50%
2017	17	6.25%	13	62.50%	3	0.00%
2018	7	-58.82%	8	-38.46%	4	33.33%
2019	2	-71.43%	6	-25.00%	1	-75.00%

Table 8: Headline earnings per share (c): Bank A to Bank C

Headline earnings per share (c)						
Year	Bank A		Bank B		Bank C	
	Ratio	% change	Ratio	% change	Ratio	% change
2015	1359		381.4		1837.9	
2016	1440	5.96%	399.2	4.67%	1769.6	-3.72%
2017	1640	13.89%	423.7	6.14%	1837	3.81%
2018	1748	6.59%	472.7	11.56%	1910	3.97%
2019	1766.7	1.07%	497.2	5.18%	1920	0.52%

ISBN NUMBER: 978-0-620-99843-7

Table 9: Headline earnings (Rm): Bank A to Bank C

Headline earnings (R' million)						
Year	Bank A		Bank B		Bank C	
	R'000	% change	R'000	% change	R'000	% change
2015	22 187 000		21 286 000		14 287 000	
2016	23 009 000	3.70%	22 855 000	7.37%	14 980 000	4.85%
2017	26 270 000	14.17%	24 471 000	7.07%	16 000 000	6.81%
2018	27 900 000	6.20%	26 411 000	7.93%	16 100 000	0.63%
2019	28 200 000	1.08%	497.2	5.18%	497.2	5.18%

Table 10: Cost to income (%): Bank A to Bank C

Cost to income (%)						
Year	Bank A		Bank B		Bank C	
	Ratio	% change	Ratio	% change	Ratio	% change
2015	56.6		50.5		56	
2016	56.3	-0.53%	51.1	1.19%	55.2	-1.43%
2017	55.7	-1.07%	51	-0.20%	56.8	2.90%
2018	57	2.33%	51.2	0.39%	57.7	1.58%
2019	56.4	-1.05%	51.8	1.17%	58	0.52%

ISBN NUMBER: 978-0-620-99843-7

Table 11: Revenue growth (%): Bank A to Bank C

Revenue growth (%)						
Year	Bank A		Bank B		Bank C	
	Ratio	% change	Ratio	% change	Ratio	% change
2015	8		12		6	
2016	10	25.00%	10	-16.67%	8	33.33%
2017	3	-70.00%	7	-30.00%	1	-87.50%
2018	3	0.00%	9	28.57%	4	300.00%
2019	5	66.67%	7	-22.22%	6	50.00%

Based on the data presented in Table 5 to Table 11, it is evident that there are major fluctuations between the various banks and years under review for each financial ratio. No clear trend could therefore be identified, which therefore required further statistical analysis to determine whether there are any correlations between the board composition variables and the financial ratios of the banks under review.

The next section elaborates on the further data analysis performed and the results are also interpreted.

Statistical analysis and interpretation

To determine whether the changes in board composition variables (i.e. independent variables) correlate with the financial performance of banks (i.e. dependent variables), over the given period, HLM (Hancock & Mueller, 2010; Huta, 2014) with the use of the SAS statistical software package (IBM SPSS Statistics Version 27, 2020), is applied. The changes in various board composition variables over various periods are compared to the change in various financial performance ratios over the same period in an attempt to identify whether the changes in the board composition variables correlate with the change in the financial performance ratios of the banks under review. Hence, various groups of data over various time periods are used, which were selected at random. The results of the HLM analysis are indicated in Table 12 below.

ISBN NUMBER: 978-0-620-99843-7

Table 12: HLM results

	% change return on equity (%)	% change total dividends per ordinary share (c)	% change total dividends per ordinary share growth (%)	% change headline earnings per share (c)	% change headline earnings (Rm)	% change cost to income (%)	% change revenue growth (%)
% Board size change							
M	-0.54	7.39	-18.84	4.97	5.59	0.48	23.10
p	0.04	0.04	0.19	0.51	0.26	0.34	0.33
Sig.	-0.07	0.90	-0.55	-0.19	-0.42	-0.11	-0.41
N	12	12	12	12	12	12	12
% Gender change							
M	-0.54	7.39	-18.84	4.97	5.59	0.48	23.10
p	0.39	0.23	0.10	0.05	0.21	0.27	0.03
Sig.	-0.21	0.58	0.77	0.85	-0.43	-0.26	0.89
N	12	12	12	12	12	12	12
% Independence change							
M	-0.54	7.39	-18.84	4.97	5.59	0.48	23.10
p	0.02	0.29	0.04	0.18	0.10	0.65	0.23
Sig.	-0.95	-0.18	-0.79	-0.56	-0.72	0.01	-0.13
N	12	12	12	12	12	12	12

Correlation is significant at the 0.05 level (2-tailed) (Pallant, 2013:250).

From Table 12 above, it is noted that most of the changes in the board composition variables did not have a statistically significant correlation ($p \leq 0.05$) with the changes in the financial performance ratios of Banks A to C. In some instances, negative correlations were also

ISBN NUMBER: 978-0-620-99843-7

observed. The next sections below present an interpretation of the above results in more detail.

Correlation of change in board size with financial performance ratios

From Table 12 it is noted that the *percentage change in board size* did have a statistically significant correlation with the *percentage change on the return on equity* ratio and the *percentage change on total dividends per ordinary share* ratio, reporting a *p*-value of 0.04 and 0.04, respectively. All other correlations were found not to be statistically significant. Therefore, it could be concluded that the size of a board may have some impact on some of the financial performance ratios of banks, but not on all financial performance measures.

Correlation of change in gender with financial performance ratios

From Table 12 it is noted that the *percentage change in gender* did have a statistically significant correlation with the *percentage change on the headline earnings per share (c)* and the *percentage change in revenue growth the ratio*, reporting a *p*-value of 0.05 and 0.03, respectively. All other correlations were found not to be statistically significant. Hence, it could be concluded that gender composition may have some impact on certain of the financial performance ratios of banks, but not on all financial performance measures.

Correlation of change in independence with financial performance ratios

From Table 12 it is noted that the *percentage change in independence* did have a statistically significant correlation with the *percentage change return on equity* and *the percentage change in the dividends per ordinary share* ratio, reporting a *p*-value of 0.02 and 0.04, respectively. All other correlations were found not to be statistically significant. Consequently, it could be concluded that the independence of the board may have some impact on certain of the financial performance ratios of banks, but not on all financial performance measures.

From the above findings, it could be deduced that some of the board composition variables did have a statistically significant correlation with the financial performance ratios, and others not. The findings in this paper therefore also obtained some contradictions, and in some instances similarities to the results of the previous studies discussed and elaborated on

ISBN NUMBER: 978-0-620-99843-7

under the literature review section. Why this is the case is beyond the scope of this study and would be a useful area for further exploration.

CONCLUSIONS BASED ON MAIN FINDINGS, RECOMMENDATIONS, LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The literature review conducted in this paper conceptualised CG and board composition which was further elaborated on, specifically within the South African context. Financial performance in general, and more specifically the baking sector and how it relates or correlates with CG were considered, and it is concluded that:

- Entities should consider the impact of the structure their boards as it seems to have an impact on some of the financial performance ratios of entities in some instances;
- It needs to be considered whether the board composition will enable the diverse perspectives, skills set and abilities that are required to successfully steer and manage a corporate entity in a specific type of business environment or industry as it may impact the financial performance in some instances;
- The effectiveness of a board could be influenced by numerous variables such as the board size; knowledge and qualifications of board members and board members' abilities and skills;
- The said board should comprise a balance of executive and non-executive directors, out of which the majority must be non-executives who need to be independent of management to protect shareholders' interests; and
- Corporate board size is one of the most important board structure variables.

Attention was shifted to previous research on the topic where it was noted that there are various best practices and policies governing board composition and that factors such as (i) *board size*; (ii) *gender diversity;* and (iii) *independence* may have a correlation with the financial performance of entities.

Finally, the financial performance measures were identified that were primarily used in previous studies focusing on the impact of board composition on financial performance. These included: (i) *return on equity*; (ii) *total dividends per ordinary share*; (iii) *total dividends*

ISBN NUMBER: 978-0-620-99843-7

per ordinary share growth; (iv) *headline earnings per share*; (v) *headline earnings*; and (vi) *cost to income*. Therefore, it could be concluded that SO_1 and SO_2 were both achieved.

To address SO_3 the secondary data was first collected and presented for each of the independent variables over the five-year period (i.e. 2015 to 2019), followed by the dependent variables applicable to this paper. Table 13 below summarises the findings of the secondary data for the dependent variables:

Table 13: Findings of the secondary data for the dependent variables

Bank A
• The board size of Bank A in 2015 amounted to 13 members after which it remained constant between 16 and 20 members. There was therefore an increase/decrease in board size year-on-year. • The board also consisted mainly of male board members, although the female representation increased over the years under review. • From an independence perspective, the independence of board members initially decreased from 2015 to 2017, after which it increased again to 75% in 2018. The latter, however, decreased again in 2019.
Bank B
• The board size of Bank B in 2015 amounted to 21 members and remained fairly constant until 2017, after which it decreased. • The board also consisted mainly of male board members, although the female representation increased over the years under review. • From an independence perspective, the independence of board members initially increased from 2015 to 2017, after which it decreased to 44% in 2018. The latter, however, increased again in 2019.
Bank C

ISBN NUMBER: 978-0-620-99843-7

- The board size of Bank C in 2015 amounted to 14 members and increased in size until 2017, after which it decreased.
- The board also consisted mainly of male board members, with little improvement in this category over the years under review.
- From an independence perspective, the independence of board members initially decreased from 2015 to 2016, after which it decreased to 72% in 2017 and ended up at 75% for 2019.

(Source: Researchers' compilation)

Deduced from the above it seems as if Bank B, compared to Bank A, showed more improvements in board representation variables over the five-year period under review. It was further deduced that it seems as if Bank C, compared to Bank A and Bank B, has a smaller board and less female representation. However, the banks compared well in connection with the number of independent non-executive directors as a percentage of the total board members.

From the data analysis performed to determine whether the board composition variables have any correlation with the financial performance ratios of the banks, the following conclusions are made:

- The *percentage change in board size* did have a statistically significant correlation with the *% change on the return on equity* ratio and the *percentage change on total dividends per ordinary share* ratio, reporting a *p*-value of 0.04 and 0.04, respectively. It therefore seemed as if the size of a board may have some impact on certain of the financial performance ratios of banks, but not on all financial performance measures;
- The *percentage change in gender* did have a statistically significant correlation with the *percentage change on the headline earnings per share (c)* and the *percentage change in revenue growth the ratio*, reporting a *p*-value of 0.05 and 0.03, respectively. It therefore seemed as if gender composition may have some impact on certain of the financial performance ratios of banks, but not on all financial performance measures;
- The *percentage change in independence* did have a statistically significant correlation with the *% change return on equity* and *the percentage change in the dividends per ordinary share* ratio, reporting a *p*-value of 0.02 and 0.04, respectively. It therefore

ISBN NUMBER: 978-0-620-99843-7

seemed as if the independence of the board may have some impact on certain of the financial performance ratios of banks, but not on all financial performance measures.
- All other correlations were found not to be statistically significant.

It could therefore be concluded that it seems as if the board composition variables may have some statistically significant correlation with the financial performance ratios of banks listed on the JSE, and that the findings in this paper therefore also obtained some contradictions, and in some instances, similarities to the results of the previous studies discussed and elaborated on under the literature review section. Hence, it could be concluded that SO_3 was achieved.

In addressing SO_4, namely to recommend (where applicable and appropriate) some possible best practice principles on board composition to banks based on the results of this paper, it does seem as if the board size, gender composition and independence of board members may have an impact on some financial performance ratios. Consequently, the following recommendations are made:

- Financial institutions should pay careful attention to the size of their boards and ensure that the number of members on the board adds value and assists the banks in improving their financial performance;
- Based on the data collected, it seems as if board members in banks predominantly consist of male members. Based on the findings of this paper, it does seem as if gender diversity is a factor impacting bank performance to a certain extent. Financial institutions such as banks should consider this fact and should further research to determine the impact that changes in this variable could have on the financial performance of banks; and
- The independence of the boards does seem to have an impact, and careful attention should be given to improve this.

The PO of this paper was t*o analyse the impact of board composition on JSE-listed banks' performance and to recommend best practices in board structure and other board-related practices for optimal financial performance of JSE-listed banks in South Africa.*

ISBN NUMBER: 978-0-620-99843-7

The attainment of the above PO was subject to achieving SO_1 to SO_4. In the preceding discussions, it was concluded that SO_1 to SO_4 were all achieved. Hence, it could therefore be concluded that the PO of this paper is met.

In respect of the overall research question of this paper, namely whether the board composition of South African JSE-listed banks have an impact on, or correlate with, such banks' financial performance or not, it could overall be concluded that it does seem as if the board composition of South African JSE-listed banks has an impact on, or correlate with, such banks' financial performance in some instances. This means that the formulated hypothesis, namely:

H_0: *The current composition of boards impacts the financial performance of South African banks listed on the JSE.*

is accepted in the context of this paper in the following instances:

- *The percentage change in board size* did have a statistically significant correlation with the *percentage change on the return on equity* ratio and the *percentage change on total dividends per ordinary share* ratio;
- *The percentage change in independence* did have a statistically significant correlation with the *percentage change return on equity* and *the percentage change in the dividends per ordinary share* ratio; and
- *The percentage change in independence* did have a statistically significant correlation with the *percentage change return on equity* and *the percentage change in the dividends per ordinary share* ratio.

Research limitations

It is acknowledged that this paper is subject to certain limitations. Hence, the findings, interpretations and conclusions drawn should therefore be interpreted within the context of these limitations being acknowledged, which includes the following:

- The paper's sample is limited to only three of the banks listed on the JSE. The findings of the paper could therefore not be generalised to the broader population of all JSE-listed banks;
- The paper only focused on a five-year period. An analysis of data stretching over a longer period might provide more reliable and accurate results;

ISBN NUMBER: 978-0-620-99843-7

- The paper only focused on quantitative financial performance measures. Other qualitative performance measures were therefore not within the scope and ambit of the current paper; and
- The reasons why, i.e. the causality of, why it seems that some of the board composition variables affect or may affect the financial performance rations of banks was not investigated.

Suggestions for further research

The results of this paper indicated that board composition variables may have some impact on some financial performance ratios of banks. The results are, however, not conclusive and cannot be generalised as noted above, and therefore warrant further investigation. The following areas for further research are therefore suggested:

- A repeat of the analysis could be conducted subject to an increase in the sample size over a longer period of time to determine whether more correlation could be identified;
- A deeper investigation into the reasons behind why the different board composition variables (both independent and dependant in nature) are affected or not affected by the financial performance ratios of banks; and
- An expansion of the analysis to banks outside the borders of South Africa listed on other international markets and security exchanges, to investigate whether similar trends could be noted on a global level.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Changes in the Extent of Sustainability Disclosure in Integrated Reports Resulting from the Implementation of King IV

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ABSTRACT

The King IV Code (King IV), which became effective on 1 April 2017, emphasised integrated thinking. Those charged with governance are further encouraged to steer their organisations to create value sustainably. King IV shares its aim of fostering integrated thinking with the International <IR> Framework (the Framework). Integrated reports are the most appropriate report to assess how an organisation sustainably creates value. This study uses content analysis to analyse the integrated reports of a sample of asset management companies listed on the Johannesburg Stock Exchange (JSE) to determine whether there has been a change in the extent of disclosure of sustainability capitals between 2015 and 2018 as a result of the implementation of King IV. Asset management companies were selected as the industry to be tested because there are minimal industry-specific laws and regulations around the interaction of financial services companies with the sustainability capitals. This study suggests that post the implementation of King IV, there has been an increase in the extent of disclosure of sustainability capitals in the integrated reports of the sample. This finding suggests that the implementation of King IV was effective in bringing about an increase in sustainability disclosure.

KEYWORDS

Asset management companies; Global Reporting Initiative (GRI); integrated reporting; integrated thinking; King IV; sustainability disclosures

INTRODUCTION

King III introduced integrated reporting to South African companies, providing an understanding of the concept and the importance of this new way of reporting (Jansen Van Vuuren & Schulschenk, 2013). Within the principles of King III, it is recommended that the integrated report be used to report both the positive and negative impacts an organisation's operations have had on all of its stakeholders. Therefore, the integrated report should include sustainability reporting and disclosure and unpack how the organisation intends to improve upon the positive strides made and ameliorate the negatives in the financial year ahead (King Committee on Corporate Governance, 2016).

In 2011 South Africa became the first country where its resident exchange required its listed companies to produce integrated reports. At that stage, King III was the King Code in effect, which obliged listed companies to produce integrated reports per King III, instructing those who complied with the Code to produce an integrated report or provide reasons for not producing the report (Solomon & Maroun, 2012). The JSE introduced into its listing requirements that companies must comply with the King Code through paragraph 3.84 of the Listings Requirements (Johannesburg Stock Exchange Limited, 2017).

King IV, which also recommends those in compliance with it to produce an integrated report, brought forward a deeper focus on the concept of stakeholder inclusivity, which is consistent with stakeholder theory, and further highlighted the value of the integrated report's production compared to King III. King IV further built on King III by highlighting that integrated reports should convey the interconnectivity and interdependence of the six capitals (King Committee on Corporate Governance, 2016).

This concentration on the understanding of the capitals and their interdependencies draws King IV closer to the ideals of the Framework. The Framework echoes this need for consideration to be paid to the link between the operations of an organisation and its operational context through fostering integrated thinking. As mentioned previously, the Framework defines integrated thinking as actively considering the relationship between the operations of an organisation and the capitals that the organisation uses or impacts (International Integrated Reporting Council, 2013).

ISBN NUMBER: 978-0-620-99843-7

Previous studies have found that the introduction of the integrated report resulted in listed companies increasing the extent of their disclosure of the six capitals (Makiwane & Padia, 2013; Setia, Abhayawansa, Joshi, & Huynh, 2015; Solomon & Maroun, 2012). These findings conclude that the introduction of integrated reporting in South Africa has also increased the extent of disclosure of sustainability capitals in the annual reports of JSE listed companies.

The effectiveness of the new King IV has not been investigated to determine if it has been effective in increasing the extent of disclosure relating to sustainability. This study seeks to investigate whether the implementation of King IV has further resulted in a change in the extent of disclosure of the sustainability capitals in integrated reports. This research focuses on the extent of disclosure of human, social and relationship, and natural capitals, defined as sustainability capitals for this study. Content analysis techniques are used to assess the extent of disclosure on the sustainability capitals. Given that conciseness and materiality are two of the Framework's guiding principles, preparers of integrated reports should only include information deemed material to the users of the integrated report (International Integrated Reporting Council, 2013). Therefore, the extent of disclosure on the sustainability capitals can gauge the importance management places on communicating the organisation's interactions with the sustainability capitals.

This study will include a summary of the literature to contextualise the research question and a detailed description of the method used to answer the research question. This is followed by the results of the test performed, the conclusion reached in answering the research questions and finally, the limitations of this study and areas for future research.

LITERATURE REVIEW

Laws, regulations, and corporate governance codes have all adapted to the current context of organisations. There have been multiple changes in regulations to encourage organisations to operate to ameliorate the positive impacts of their operations and pay more significant consideration to stakeholders other than the shareholders (Esser & Delport, 2018). The JSE Listing Requirements were amended to make it mandatory for listed companies to comply with the current applicable King Code and disclose, in compliance with paragraph 8.63(a), certain aspects of their compliance in their annual reports (Johannesburg

ISBN NUMBER: 978-0-620-99843-7

Stock Exchange Limited, 2017). In recent years, the financial services industry has introduced new regulations such as Treating Customers Fairly (TCF), an outcome-based regulatory approach to safeguard fair outcomes for financial services consumers, ensuring they are delivered by regulated financial firms (Financial Services Conduct Authority, 2011).

History of King reports

The King III report was born in acknowledgement that the dimensions of the economy, society and nature are all interlaced and cannot be separated (Esser & Delport, 2018). The triple bottom line concept, present in The King II Report (King II), was revised to the term 'triple context' in King III. This new concept encouraged organisations to be acting responsibly within the environmental, social and ethical contexts, which has become a business imperative for leading South African organisations (Colquhoun, 2019; Esser & Delport, 2018).

In 2010, soon after the release of King III, Professor Mervyn King observed that the context in which companies operate had changed completely (Baker, 2010). Companies face many crises, namely financial crises, climate change, and environmental crises, resulting in an increased focus on sustainable operations. Therefore, consideration should be distributed between financial, human, environmental, and social concerns (Baker, 2010).

With consumers having greater access to information, corporate misconduct or disregard for social, ethical, and environmental causes is quickly discovered. Consumers are largely intolerant to transgressions made by large firms in this regard, and thus organisations face the risk of losing their social licence to operate should they act irresponsibly (Colquhoun, 2019; Green & Peloza, 2014). As a result of these threats to the legitimacy of organisations, both as a result of regulation and societal pressures, governing bodies have been charged with the duty to steer their organisations to create value sustainably, addressing all three of these contexts (King Committee on Corporate Governance, 2016).

King IV deems it essential to encourage organisations to appreciate the interconnectivity and interdependence of the capitals and their relationship with them. The Code considers organisations integral parts of society, granting them status as corporate citizens (King Committee on Corporate Governance, 2016). King IV thus charges organisations, in their

ISBN NUMBER: 978-0-620-99843-7

capacity as corporate citizens, to take an integrated approach to value creation (King Committee on Corporate Governance, 2016).

King IV: integrated reporting

King III introduced the understanding and importance of integrated reporting in South African companies (Jansen Van Vuuren & Schulschenk, 2013). In Principle 9.2 of King III, it is recommended that all companies produce an integrated report to report the positive and negative impacts the organisation's operations have had on its stakeholders. The integrated report should include sustainability reporting and disclosure, unpacking how the organisation intends to improve the positives and ameliorate the negatives in the financial year ahead (Institute of Directors of Southern Africa, 2009). These principles illustrate the inclusive stakeholder approach which King III seeks to emphasise.

King IV, which became effective in April 2017, further highlights the value of the production of the integrated report and stakeholder inclusivity by providing governing bodies with more significant guidance on deploying the inclusive stakeholder model in the disclosures made in the integrated reports. King IV accomplishes this by emphasising that reports produced by those charged with governance should be produced in contemplation of the legitimate interests and expectations of all of the organisation's stakeholders, all of which should be balanced (EY, 2016; King Committee on Corporate Governance, 2016). At present, JSE listed companies must comply with King IV in producing their integrated reports as this is the King Code currently in effect (Johannesburg Stock Exchange Limited, 2017).

King IV: stakeholder inclusivity

King IV increased the focus on stakeholder inclusivity (King Committee on Corporate Governance, 2016), which links to stakeholder theory. Stakeholder theory suggests that organisations should consider the valid needs of all of their stakeholders (Freeman, 1984). However, the focus can either be on only those that are most powerful and influential, as suggested by the managerial branch of stakeholder theory, or on all stakeholders, no matter their ability to influence the organisation, in terms of the ethical branch of the theory (Deegan, 2014).

ISBN NUMBER: 978-0-620-99843-7

King IV increases the stakeholder focus by highlighting integrated thinking in business and stressing that the governing body should "appreciate that the organisation's core purpose, … performance and sustainable development are all inseparable elements of the value creation process" (King Committee on Corporate Governance, 2016:40). The interconnectivity of all of these elements and the value creation process through the deployment of the six capitals, as defined in the Framework (International Integrated Reporting Council, 2013), are recommended to be disclosed in an integrated report (Roberts, 2017). The governing body is responsible for ensuring that the integrated reports prepared allow all stakeholders to make an informed assessment of the organisation's performance and its ability to create value in a sustainable manner (King Committee on Corporate Governance, 2016). This focus on all stakeholders is consistent with the ethical branch of stakeholder theory.

Therefore, the integrated report is designed to provide investors with an additional resource to aid them in making capital allocation decisions. However, it acknowledges that organisations must address the social, environmental, and economic challenges present in their operational context for there to be a value creation story (International Integrated Reporting Council, 2013; KPMG, 2011). Therefore, the integrated report is a space in which a company's entire value creation story can be told – detailing how the company uses the inputs of their capitals to meet their strategic objectives and how the company creates value for those capitals (Setia *et al*., 2015). The integrated report thus creates a platform on which companies can disclose both financial and non-financial information, connecting sustainability concerns with the company strategy to maximise returns to investors.

King IV: apply *and* explain

King IV seeks to foster transparency regarding how organisations use judgment in their applications of the recommendations of the Code. Organisations are instructed to 'apply *and* explain' their compliance with the principles of King IV in contrast to the 'apply *or* explain' concept found in King III (King Committee on Corporate Governance, 2016). Therefore the application of the principle is assumed. An explanation is used to disclose, on a high level, how these principles have been put into practice and the progress made towards realising each principle (Esser & Delport, 2018).

ISBN NUMBER: 978-0-620-99843-7

In King III, there was limited guidance on the contents of the integrated report. Combined with the 'apply or explain' principle, this limited guidance created an opportunity for preparers of integrated reports to use total discretion when complying with King III (Setia *et al*., 2015). By contrast, King IV provides those who comply with the Code with precisely what to disclose in the integrated report. Furthermore, King IV applies the concept of 'apply *and* explain'; thus, there is no practical alternative to making the required disclosures (Institute of Directors of Southern Africa, 2009; King Committee on Corporate Governance, 2016).

With the introduction of King IV, with its revised foundational principles, organisations may have been driven to adapt the extent of disclosure on the sustainability capitals. The Code has its foundational principles being ethical leadership, the organisation in society, corporate citizenship, sustainable development, stakeholder inclusivity, integrated thinking and integrated reporting and the change from an 'apply *or* explain' to an 'apply *and* explain' basis (King Committee on Corporate Governance, 2016).

Previous research and research opportunity

Previous research has found that the introduction of the integrated report resulted in listed companies increasing the extent of their disclosure of the sustainability capitals (Setia *et al*., 2015). This increase in the extent of disclosure of sustainability capital information was evidenced by a greater emphasis on non-financial measures and attempts at integrating the capitals to create a holistic image of how the companies operate in their triple context (Atkins & Maroun, 2015).

Maroun and Solomon (2012) found that King III succeeded in giving social, environmental, and ethical information a greater presence in organisations' annual reports. Their study also found that the introduction of King III brought about a substantial increase in the quantity of information on social, environmental, and ethical concerns reported in the annual reports of a sample of JSE listed companies.

A study performed by Setia *et al*. (2015) found that the introduction of integrated reporting in South Africa increased the extent of disclosure of the sustainability capitals, with there being a statistically significant increase in the disclosure of social and relationship capital from the 2009/2010 to the 2011/2012 integrated reports of a sample of 25 JSE listed

ISBN NUMBER: 978-0-620-99843-7

companies. Maroun and Solomon (2012) also noted a substantial increase in the reporting of social information post the implementation of King III.

Therefore, there is an opportunity to investigate whether the introduction of King IV has brought about a further change in the extent of disclosure of sustainability capitals. For this study, the integrated reports of a sample of asset management companies listed on the JSE are examined to determine whether, post the implementation of King IV, there has been a change in the extent of the disclosure of sustainability capitals.

Asset management companies were selected as the industry to be tested because there are minimal industry-specific laws and regulations around the interaction of financial services companies with the sustainability capitals. According to Falkena, Bamber, Llewellyn and Store (2001), financial regulation in South Africa primarily aims to achieve economic efficiency and consumer protection in the economy. As such, the Financial Services Conduct Authority chiefly exists to ensure that South Africans are treated fairly by financial services providers and can enjoy a safe investment environment (Financial Services Conduct Authority, 2011). With the minimal laws and regulations around asset management companies' interactions with the sustainability capitals, this study can further isolate the effects of the implementation of King IV on changes in sustainability disclosure. However, the study's findings may be influenced by the changes in the laws and regulations of the financial services sector which occur in the test years.

In the 2017/2018 financial year, the Financial Services sector experienced the introduction and proposal of multiple laws and regulations. These include the Financial Sector Regulation Act 9 of 2017, which came into effect on 1 April 2018, the Conduct of Financial Institutions Bill and Treating Customers Fairly, the Information Regulator of the Protection of Personal Information Act 4 of 2013, publishing draft regulations in 2017 and the proposal of the Financial Sector Code, to name but a few. Therefore, increased disclosure may be anticipated due to the significant changes in the regulatory environment of the Financial Services sector in the 2017/2018 financial year. However, the additional regulation had minimal impact on the sustainability capitals.

ISBN NUMBER: 978-0-620-99843-7

The asset management sector has also been selected because it is an industry that has not experienced a notable scandal between 2015 and 2018. This fact is being controlled for because notable scandals may influence the extent of disclosures of sustainability capitals. Companies may wish to increase disclosure post a scandal to gain or retain stakeholder trust and repair legitimacy (Beck, Dumay, & Frost, 2017; Suchman, 1995).

This study focuses on the sustainability capitals because, as previously mentioned, consumers are largely intolerant to transgressions made by large firms concerning corporate misconduct or corporate disregard for social, ethical, and environmental causes. Consequently, organisations face the risk of losing their social licence to operate and legitimacy should they act irresponsibly in this regard (Colquhoun, 2019; Green & Peloza, 2014). Additionally, as expanded upon earlier, the introduction of King IV also brought about an emphasis on sustainability and increasing sustainability disclosure.

METHOD

This study seeks to assess whether the implementation of King IV has brought about a change in the extent of sustainability disclosure in integrated reports. This study compares disclosures on sustainability capitals in the integrated reports of a sample of asset management companies listed on the JSE to identify if there has been a change in the extent of the disclosures made on sustainability capitals after the introduction of King IV. The integrated reports from 2015 (before the release of King IV) and 2018 (post the release of King IV) were examined.

When this study was conducted, the most recent integrated reports were those for the 2018 financial years of companies. The timing limits the comparability of the research. The core reason is that in 2015, King III had been in effect for approximately five years, whereas in 2018, King IV had been in effect for less than a year. The Integrated Reporting Committee of South Africa (IRCSA) and the International Integrated Reporting Council (IIRC) have acknowledged that effective integrated reporting will come with time as the preparers of the integrated report need to be granted the opportunity to become accustomed to the change in culture (Atkins & Maroun, 2015). The 2018 integrated reports were the first since King IV came into effect. Therefore the disclosures made under King IV may not be as effective as those in future integrated reports because the preparers had not had sufficient exposure to

ISBN NUMBER: 978-0-620-99843-7

the new King Code and were thus not yet well versed with King IV. However, this limitation is less significant because the principles of King IV are an enhancement of those in King III Content analysis has frequently been used as an empirical research tool in environmental reporting, giving it validity as a research tool (Hooks & Van Staden, 2011). As a result, this study uses content analysis techniques to codify the qualitative information drawn from the analysis of the integrated reports into categories. This method aids the measurement of the extent of disclosures made. After that, it enables the study to conclude whether there has been a change in the extent of disclosures of sustainability capitals after King IV's implementation.

The Framework (International Integrated Reporting Council, 2013) provides six capitals that should be included in the report. The human, natural, and social and relationship capitals are considered sustainability capitals for this study because they align closely with the disclosure categories provided by the Global Reporting Initiative (GRI) (Global Reporting Initiative, 2018).

The GRI guidelines are the most widely used sustainability reporting guidelines (Marimon, Alonso-Almeida, Rodríguez, & Cortez Alejandro, 2012). This study uses the GRI disclosure guidelines to generate a rubric that assesses the extent of disclosure on the sustainability capitals. The GRI series are inspected for information items related to the definition of each sustainability capital, and those relevant information items are included in the rubric. The rubric, included in the Appendix, records the presence or absence of the disclosures on those information items in the integrated reports.

The GRI disclosure guidelines have been chosen as a basis from which the rubric is generated. These guidelines are an internationally recognised and established framework. Both King III and King IV recommend using the GRI guidelines to inform what disclosures should be made in the integrated report (Institute of Directors of Southern Africa, 2009; King Committee on Corporate Governance, 2016). The rubric had human capital, natural capital, and social and relationship capital categories. As suggested by the GRI standards, all relevant information items are listed.

ISBN NUMBER: 978-0-620-99843-7

A pre-test coding on the sample of integrated reports was performed to assess the reliability and validity of the rubric generated as per the recommendations of Merkl-Davies, Brennan, and Vourachis (2011). The rubric was then revised to include additional information items that were recurring disclosures made for each of the sustainability capitals in the sample of integrated reports. These items were 'employee engagement and value add' and 'sustainable operations' for human capital and natural capital, respectively, and 'customer value add' and 'trust building and stakeholder value add' for social and relationship capital. Given that this study is a disclosure index study, the presence or absence of specific information items is used as the recording unit (Merkl-Davies *et al*., 2011). Both positive and negative disclosures will be recorded as disclosures. Therefore, this study considers any sentence that discusses or mentions any aspect of any of the sustainability capitals or their relationship with the organisation in question as a relevant disclosure (Hooks & Van Staden, 2011). A tally is kept of the number of sentences meeting the criterion, and the results between 2015 and 2018 are compared.

The sample of listed companies selected for this study was from the JSE financial services: asset management sector. JSE listed companies have been chosen as it is a listing requirement for all JSE listed companies to comply with the applicable King Code during the periods in question. In addition, their integrated reports are readily available.

There are nine companies listed under the asset management bracket of the financial sector of the JSE. However, only five of these companies were possible research subjects for this study. The reasons for companies being excluded from the study are:

1. They were unlisted in 2015, and thus their 2015 integrated reports were not produced in compliance with King III.
2. They are dual-listed companies and are thus subject to other corporate governance codes (such as the United Kingdom Corporate Governance Code).

This process resulted in Anchor Group, Alexander Forbes Group Holdings, Coronation Fund Managers, Peregrine Holdings Limited and Efficient Group being included in the sample. Each company stated within the scope of their 2015 and 2018 integrated reports that they complied with the relevant King Code.

ISBN NUMBER: 978-0-620-99843-7

The change in the extent of disclosure from the 2015 to the 2018 reports was analysed. Furthermore, a paired sample t-test[1] was performed to assess whether the change in the extent of disclosure is statistically significant. The test results will be presented and discussed in the following section.

RESULTS

The 2015 and 2018 integrated reports of Anchor Group, Alexander Forbes Group Holdings, Coronation Fund Managers, Peregrine Holdings Limited and Efficient Group were examined for the extent of disclosure of the sustainability capitals. The results are presented below.

Table 1: The extent of disclosure of the sustainability capitals in the 2015 and 2018 integrated reports

	Extent of Disclosure		Percentage Change (%)
	2015	**2018**	
Human Capital	796	1 149	44,35
Natural Capital	64	142	121,88
Social and Relationship	1 469	2 050	39,55
Total Disclosure	2 329	3 341	43,45

1 All of the assumptions for a paired t-test were tested and met

ISBN NUMBER: 978-0-620-99843-7

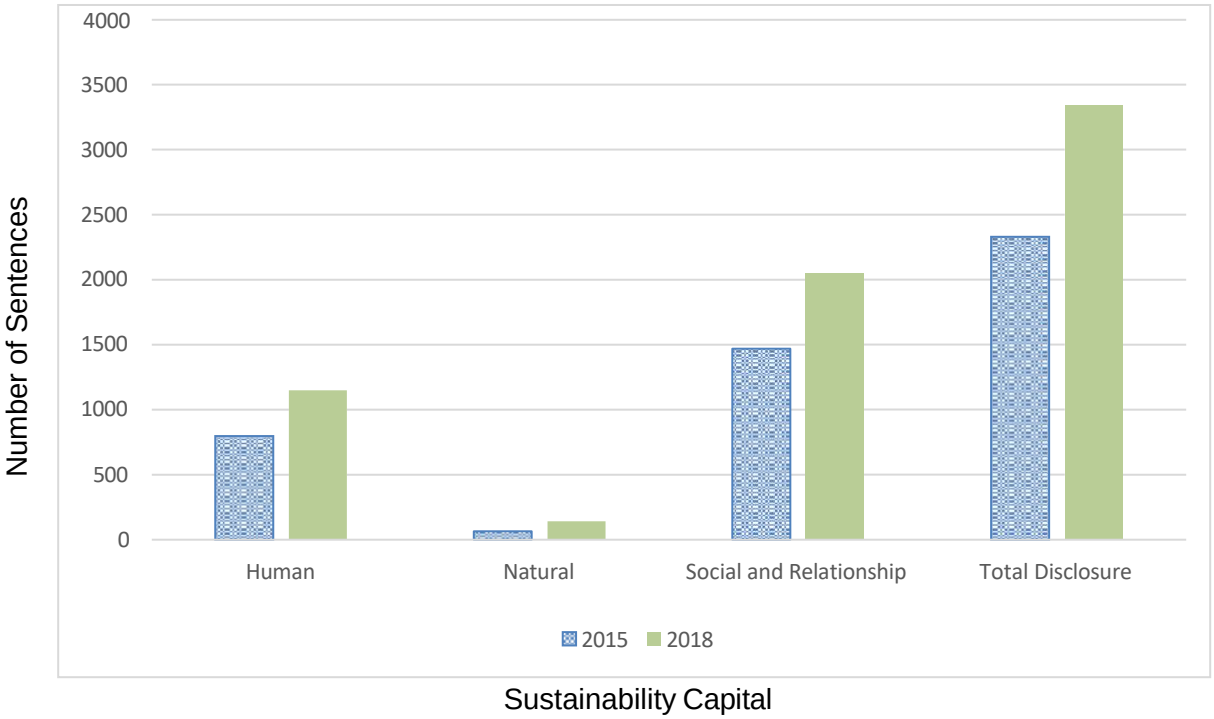

Figure 1: Extent of sustainability capital disclosures in the 2015 and 2018 integrated reports

As illustrated by Table 1 and Figure 1 above, there was a 43,45% increase in the extent of disclosures of sustainability capitals between the 2015 and 2018 integrated reports. This increase comprised a 44,35% increase in the total quantity of human capital disclosure between the 2015 and 2018 integrated reports, a 121,88% increase in the total quantity of natural capital disclosure between the two years and lastly, approximately a 40% increase in the extent of disclosure of social and relationship capital between the 2015 and 2018 integrated reports.

In performing the paired sample t-test, the p-value was found to be 0.0364, which allows the study to conclude with 95% confidence that the difference in sustainability disclosure post the implementation of King IV is statistically significant.

The Anchor Group integrated report was difficult to read and did not disclose a large quantity of relevant information. This poorer quality integrated report may result from the company only having listed on the Johannesburg Stock Exchange for the first time on 16 September 2014. As a result, their integrated report for the year ended 31 December 2015 was only

ISBN NUMBER: 978-0-620-99843-7

their second integrated report that had to comply with a King Code. The 32,52% increase in the sustainability disclosures from 2015 to 2018 may therefore be partly attributable to the fact that the preparers of the integrated report were now more experienced and had a greater understanding of how to prepare an integrated report in compliance with a King Code.

Human Capital

The asset management companies examined each increased the human capital disclosures presented between 2015 and 2018. The individual results per company are shown in Figure 1 below.

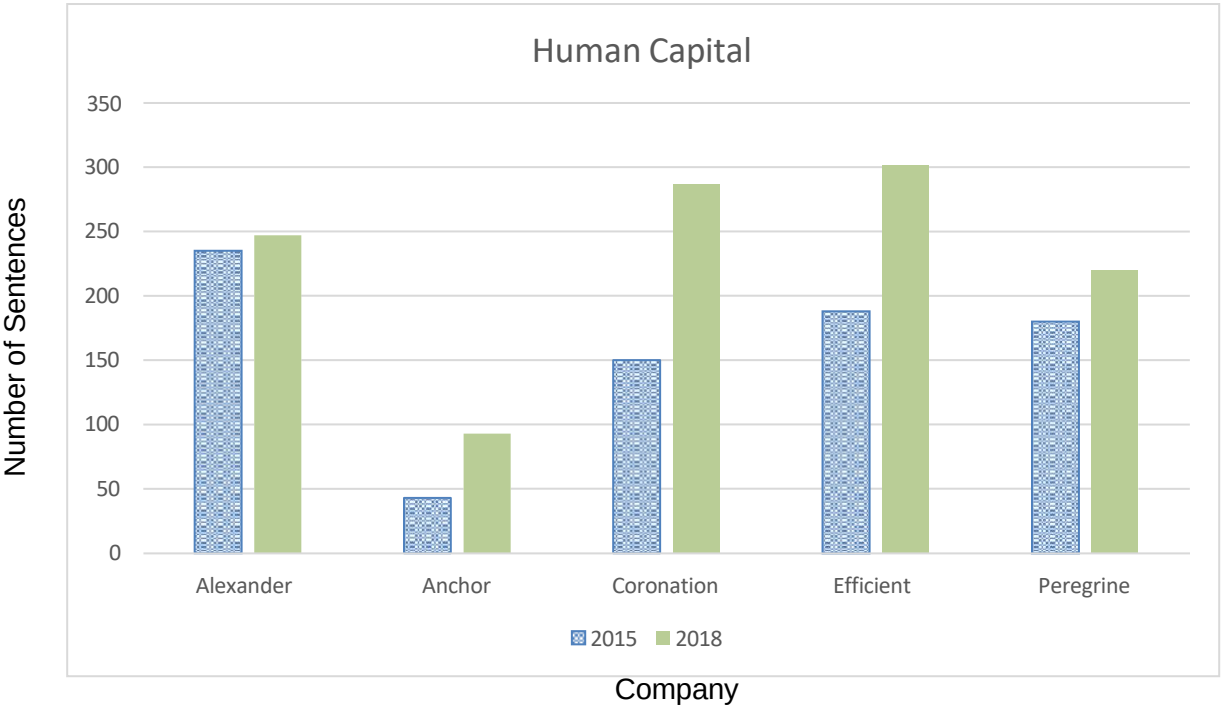

Figure 2: Disclosure of human capital in the 2015 and 2018 integrated reports

Amongst all of the integrated reports tested, the Anchor Group (Anchor) and Coronation Fund Managers (Coronation) experienced the most significant change in the extent of human capital disclosure, as evidenced in Figure 2. Consideration should be paid to the fact that only 43 sentences were counted as disclosures of human capital in the 2015 integrated report of Anchor. The increase to 93 disclosures made in the 2018 integrated reports is why a 116,28% increase in human capital disclosure for Anchor was recorded in the study. This finding contrasts with Efficient Group (Efficient), which presented a 60,64% increase in human capital disclosure, growing from 188 disclosures in 2015 to 302 in 2018.

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The most significant changes in the human capital disclosures of Anchor between the 2015 and 2018 integrated reports were a 200% increase on the 2015 disclosures around new employee hires/employee turnover/employee retention strategies, employee performance and career development reviews, and the diversity of governance bodies and employees. There was also a notable increase in the disclosures made around promoting employment equity.

In the Coronation integrated reports, there was also a considerable increase in the disclosure of new employee hires/employee turnover/employee retention strategies and employee performance and career development reviews between the 2015 and 2018 integrated reports. Contrastingly to Anchor, Coronation further disclosed the benefits they provided full-time employees and the minimum notice periods regarding operational changes in their 2018 integrated report compared to their 2015 integrated report.

Alexander Forbes Group Holdings (Alexander Forbes) experienced a minor change in the extent of human capital disclosure between the companies tested, with a 5,11% increase between the 2015 and 2018 integrated reports. However, it is to be noted that among all of the companies tested, Alexander Forbes reported the most extensively on human capital in 2015 and was second to Coronation in 2018 (a company that experienced a 91,33% increase in their human capital disclosure between 2015 and 2018).

The majority of the disclosure made on the human capital across all of the companies tested was employee engagement, new employee hires/employee turnover/employee retention strategies, employee training, employee performance and career development reviews and the diversity of governance bodies and employees. Across all of the integrated reports, there was an emphasis on the importance of a highly skilled and knowledgeable workforce as they would best provide value to the organisation and its clients. As such, most companies identified that attractive employee benefits, employee training and development, and performance-based incentives all form part of a company's employee retention strategy and attract new marketable employees. Furthermore, the diversity of the governance bodies was further expanded on in the 2018 integrated reports, with the majority of the companies breaking down what makes the composition of the board and the employees of the company diverse (i.e. by race and gender).

ISBN NUMBER: 978-0-620-99843-7

The increased disclosure of the composition of the governance bodies of the companies and the remuneration packages given to staff (i.e. the employee variable benefits granted) may be correlated to specific changes made in the move from King III to King IV. King IV places specific emphasis on the composition of the governing body in Principle 7 and stresses the need for the disclosure of the remuneration policy of an organisation that should be fair, responsible and transparent in Principle 14 (King Committee on Corporate Governance, 2016). Therefore, these principles may have incentivised companies to increase the volume of their disclosure regarding these information items.

It is clear from the results that the companies are placing greater emphasis on the human capital element of their organisations. The increased disclosures are evidence of what is considered material to the company. The companies also appear to be seeking increased legitimacy by addressing concerns raised by King IV.

Natural Capital

Between all of the integrated reports tested, all of them produced distinctly less disclosure of their impact on natural capital or how they seek to create value for this capital. For this reason, the 121,88% increase in the disclosure of natural capital between 2015 and 2018 should be contextualised. The disclosure moved from 64 sentences between all companies to 142 sentences in absolute terms. The individual results per company are presented in Figure 3 below.

ISBN NUMBER: 978-0-620-99843-7

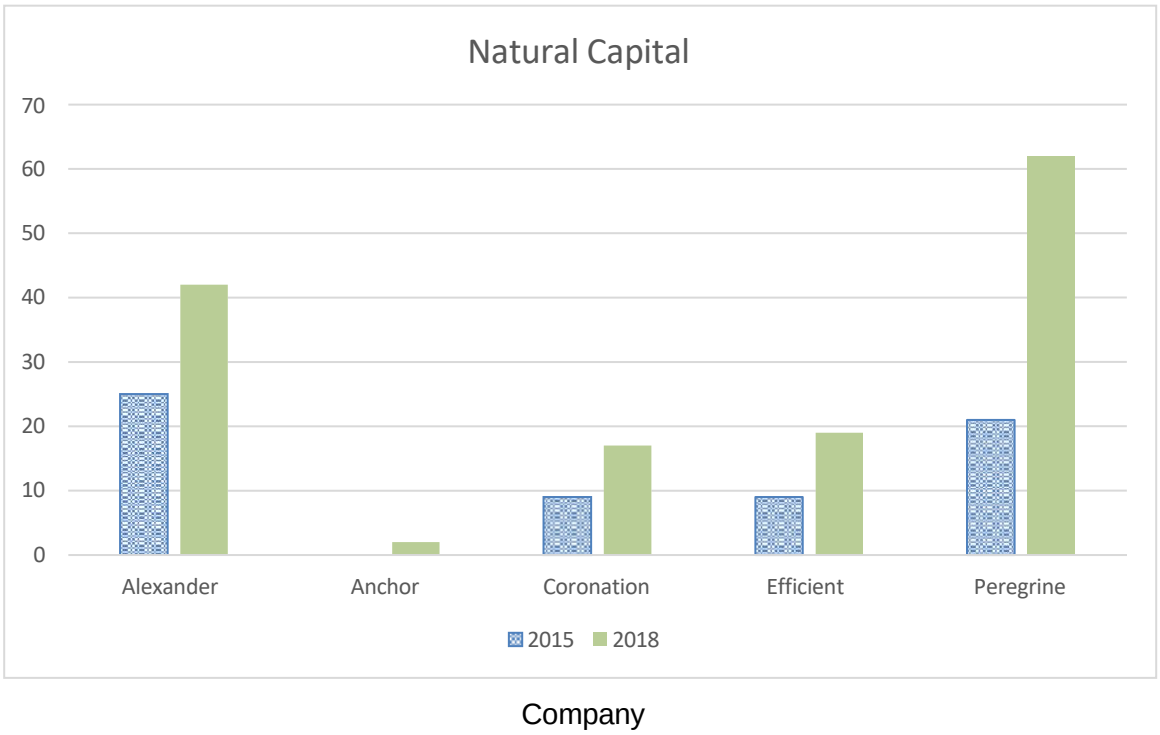

Figure 3: Disclosure of natural capital in the 2015 and 2018 integrated reports

Coronation stated in their 2018 Integrated Report that they do not consider natural capital as material to their business and their value creation story. Thus, there is relatively less disclosure around natural capital than other capitals. This sentiment is in line with the disclosure guidelines of the Framework, which states that there may be cases where an organisation's interactions with certain capitals are so minor or primarily indirect that those capitals are not sufficiently material to disclose in the integrated report (IIRC, 2013). This sentiment seemed to be shared amongst the other organisations tested as they all had relatively similar quantities of natural capital disclosure.

Peregrine Holdings Limited (Peregrine) displayed the most significant change in the extent of natural capital disclosure, increasing 195,24% between the 2015 and 2018 integrated reports. This change was mainly driven by the fact that in the 2015 integrated report, Peregrine stated its intention to monitor its carbon footprint in response to the Carbon Disclosure Project (CDP). In 2018, they fully disclosed their Carbon Footprint Assessment, going so far as to disclose the volumes of their greenhouse gas emissions. Peregrine also further disclosed their water and energy consumption and waste management process in their 2018 integrated report, which they did not disclose in their 2015 integrated report.

ISBN NUMBER: 978-0-620-99843-7

Peregrine, Alexander Forbes, and Coronation all mentioned that they had 'green' offices that minimised energy and water consumption, reduced waste and discouraged excessive paper use. Such disclosures were all recorded under the sustainable operations information item of the rubric. Consequently, the sustainable operations, energy, waste, and water management information items dominated the companies' natural capital disclosures between 2015 and 2018.

Alexander Forbes provided the most disclosure on natural capital in its 2015 integrated report and was closely followed by Peregrine. Furthermore, Peregrine made the most natural capital disclosure compared to all the other companies' 2018 integrated reports.

A notable change in Alexander Forbes' disclosure of natural capital between 2015 and 2018 is that in 2018 they disclosed information such as the fact that their operations are not in and around regions of high biodiversity value, which they did not disclose in 2015. They also broke down their water withdrawal and the sources of the water used, which they too did not disclose in 2015. There may be a correlation between increased water disclosure and the organisation's operations being affected by the water crisis in the Western Cape that came to a head in 2018 (Muller, 2017).

Between all of the companies tested, there was minimal disclosure of how they are creating value for the natural capital they use or the natural capital in the areas around which they operate. The disclosure was predominately centred around what natural capital the companies use and how they strive to reduce their withdrawal from the environment. This finding may result from the companies having so little interaction with natural capital that it would not be material to disclose this information, as suggested by the fundamental concepts of the Framework (IIRC, 2013).

Social and Relationship Capital

The 39,55% total increase in disclosure of social and relationship capital between the 2015 and 2018 integrated reports mainly constitutes the increases in disclosure of the social and relationship capitals of Efficient and Coronation. The results per company are included in Figure 4.

ISBN NUMBER: 978-0-620-99843-7

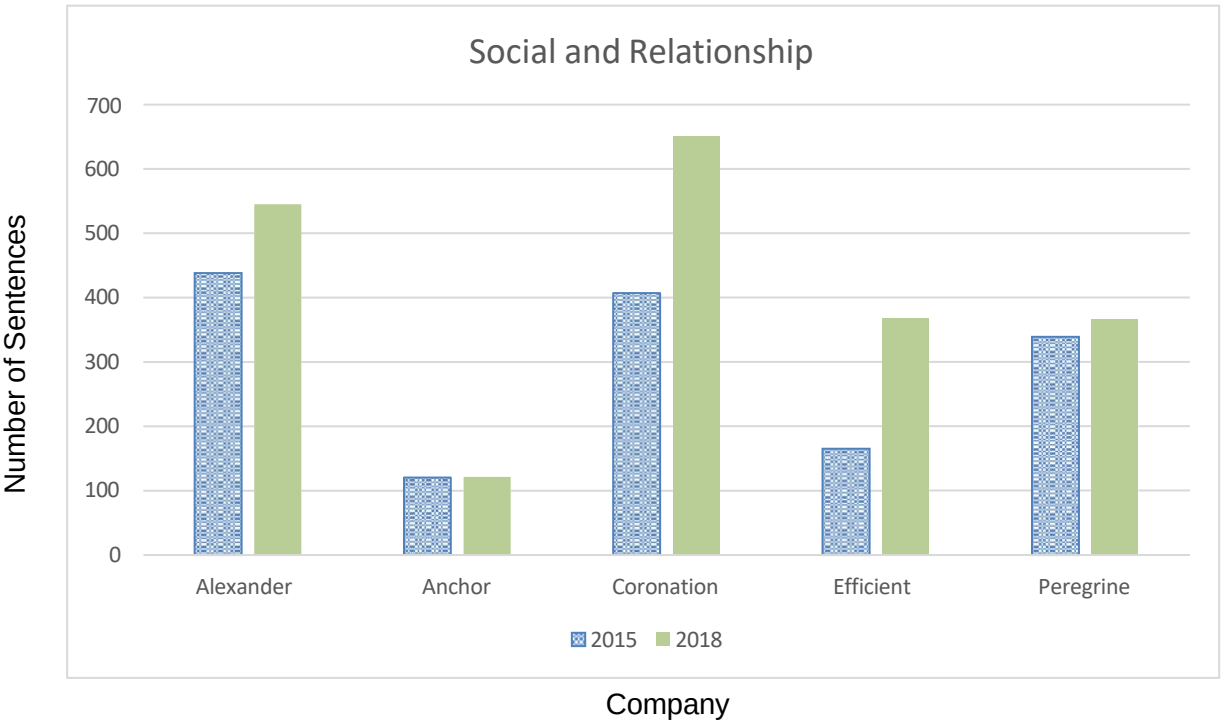

Figure 4: Disclosure of social and relationship capital in the 2015 and 2018 integrated reports

In contrast to the 2015 integrated report of Efficient, the 2018 integrated report presented a 123,03% increase in the volume of disclosure made regarding its social and relationship capital. This increase was predominantly because of the increase in the disclosure of Efficient's communication and training about anti-corruption policies and procedures and their increased disclosure on how they consult their stakeholders on economic, environmental, and social topics.

Coronation increased their social and relationship capital disclosure by 59,71% between their 2018 and 2015 integrated reports. This increase was mainly driven by a 104,44% increase in disclosing their operations with local community engagement and development programs.

In their 2018 integrated report, Coronation detailed the multitude of initiatives they are spearheading to create value for the society they operate in and the greater South Africa. Such initiatives include, but are not limited to, supporting black businesses in the financial sector, bursaries and skills development, and preferential procurement.

ISBN NUMBER: 978-0-620-99843-7

Coronation also further disclosed their risk assessment for fraud risk, as did most other companies tested. This increased attention to fraud risk and anti-corruption is most likely in response to the abundance of corporate scandals that embroiled the South African corporate landscape in 2018.

Alexander Forbes displayed a notable 24,41% increase in their social and relationship capital disclosure, mainly due to their increased disclosure of their corporate social investment initiatives through the Alexander Forbes Community Trust. In their 2018 integrated report, Alexander Forbes went into greater detail about the social initiatives they run to build community and help promote the 'financial well-being' of the residents of local communities.

Alexander Forbes also further disclosed their commitment to responsible investing in its 2018 integrated report. In their 2018 integrated report, Alexander Forbess disclosed that the company ensured that they and the asset managers they contracted evaluated the financial aspect of matters and evaluated the environmental, social, and governance elements in their investment decisions.

The disclosures relating to social and relationship capital were overall heavily weighted towards information items such as the values and ethics of the organisation, consulting the stakeholders on economic, social, and environmental issues, operations with local engagement and skills development, transformation, and compliance with laws and regulations. Outside of compliance with laws and regulations, the move from King III to King IV can be used to hypothesise the reason behind this change. Ethical culture and ethical leadership are cornerstones of King IV (King Committee on Corporate Governance, 2016). Therefore, the increased disclosure of the companies' ethical cultures could be attributed to the shift from King III to King IV.

King IV advocates for a stakeholder-inclusive approach, whereby the legitimate interests and expectations of all of the organisation's stakeholders should be balanced (EY, 2016; King Committee on Corporate Governance, 2016). The change in the quantity of disclosure regarding the consulting of stakeholders may be ascribed to the greater emphasis on the stakeholder-inclusive approach found in King IV in contrast to King III.

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Many of the companies disclosed their identification of the opportunities in corporate social initiatives. This opportunity is that having operations that positively impact the community could boost their brand reputation and increase the economic standing of individuals who will invest with the asset management companies or join a workforce for which the asset managers will manage the pension fund.

The increased disclosure of transformation initiatives and local development programmes may not have only resulted from the shift from King III to King IV, which calls for a stakeholder-inclusive approach. It could also be a result of the new Financial Sector Code, which aims to transform the financial sector so that the demographic of South Africa is reflected in it (Financial Sector Charter Council, 2016). The Financial Sector Code that came into effect on 1 December 2017 also impacted the disclosures presented.

CONCLUSION

The introduction of King IV presented an opportunity to investigate if this new guidance would lead to a change in the disclosures presented by companies. Consistent with prior research that found a significant change in disclosures following the introduction of new guidelines (Setia *et al*., 2015; Solomon & Maroun, 2012), there has been a statistically significant increase in the extent of disclosure of the sustainability capitals between the 2015 and 2018 integrated reports of a sample of asset management companies, following the introduction of King IV. This change in the extent of disclosure is represented by a 43,45% increase in the total sustainability capital disclosures made in the 2018 integrated reports compared to the sustainability capital disclosures made in the 2015 integrated reports. This finding indicates that the companies in the sample are considering a broader range of stakeholders, consistent with the ethical branch of stakeholder theory.

There was a 44,35% increase in human capital disclosure across the companies, chiefly due to how they interact with their staff. These disclosures included increased disclosure around employee engagement, new employee hires/employee turnover/employee retention strategies, employee training, employee performance and career development reviews and the diversity of governance bodies and employees.

ISBN NUMBER: 978-0-620-99843-7

The main contributing factor to the 121,88% increase in the extent of disclosures from 2015 to 2018 of natural capital was increased disclosures around the impact organisations have on natural capital. Such disclosures included water and energy consumption, recycling, and waste management.

Dominating the approximately 40% increase in the extent of disclosures around social and relationship capital were increased disclosures regarding organisations adding value to society. These included increased transformation and corporate social initiatives, consulting stakeholders on economic, social, and environmental issues and operations with local engagement and skills development. There were also notable increases in disclosures made around compliance with laws and regulations, but this may be ascribed to the fact that there were multiple new and proposed regulations for the financial sector in the 2017/2018 financial year.

Given that two of the guiding principles of the integrated report are conciseness and materiality, it can be deduced that the extent of disclosure on a capital can be used to gauge the importance that management places on communicating the organisation's interactions with that particular capital to its stakeholders. The increase in the total sustainability capital disclosures from 2015 to 2018 may suggest that management is placing greater importance and consideration on conveying to the users of its integrated report how their organisations interact with the sustainability capitals to meet the information needs of a broader group of stakeholders. In placing greater importance and consideration on communicating how their organisations interact with the sustainability capitals, management draw closer to achieving the ideal expressed in King IV that the governing body "appreciate that organisation's core purpose… performance and sustainable development are all inseparable elements of the value creation process" (King Committee on Corporate Governance, 2016:47).

In conducting this study, limitations and areas for future research were identified. The study was conducted on a small sample of companies. Furthermore, the full effect of the implementation of King IV on the disclosure of sustainability capital may not have been realised in the production of the 2018 integrated reports by organisations due to the Code only recently coming into effect. However, this is negated to some extent by the fact that integrated reporting was no longer a new concept with the introduction of King IV. However,

ISBN NUMBER: 978-0-620-99843-7

King IV provided further guidance and direction. In future, this research should be repeated and compare the 2015 integrated reports with, at minimum, the 2020 integrated reports of an organisation. This future research would allow preparers of the integrated reports enough time to fully understand King IV and become proficient in its implementation, as would have been the case with King III in preparing the 2015 integrated report.

A further limitation is that the study did not control for changes in the laws and regulations of the industry selected. Although none of the regulations changes was directly related to the sustainability capitals, it can be stated that there was a significant amount of change in the regulatory environment of the financial services sector in the 2017/2018 financial year, which would feed through into disclosures made in the integrated reports. Therefore, a recommendation for future research would be to select a sector that has experienced little to no regulatory changes between the two test years to control for the effect changes in regulation have on the disclosures made. However, the asset management sector has placed significant additional emphasis on sustainability.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

APPENDIX

Rubric

HUMAN CAPITAL

Information items as per GRI Standards (400 Series)
Employment
New employee hires and employee turnover
Benefits provided to full-time employees
Parental leave policy
Employee Engagement
Labour/Management relations
Minimum notice periods regarding operational changes
Defined benefit plan obligations and other retirement plans
Occupational Health and Safety
Occupational health and safety system
Hazard identification, risk assessment and incident investigation
Occupational health services
Worker participation, consultation and communication on occupational health and safety
Worker training on occupational health and safety
Promotion of worker health (e.g. provision of non-occupational medical and healthcare services)
Prevention and mitigation of occupational health and safety impacts
Work-related injuries
Work-related ill-health
Training and Education
Average hours of training per year per employee
Programs for upgrading employee skills and transition assistance programs (including security personnel)
Employee performance and career development reviews
Diversity and Equal Opportunity
Diversity of governance bodies and employees
Ratio of basic salary and remuneration of women to men
Non-discrimination
Incidents of discrimination and corrective actions taken
Promotion of employment equity
Freedom of Association and Collective Bargaining
Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk

ISBN NUMBER: 978-0-620-99843-7

NATURAL CAPITAL

Information items as per GRI Standards (300 Series)
Materials
Non-renewable materials used
Renewable materials used
Recycled input materials
Reclaimed materials
Energy
Energy consumption and/or reduction
Water and Effluents
Water withdrawal (and, if applicable, source of water)
Water discharge (and, if applicable, to which source of water)
Water consumption and/or reduction
Biodiversity
Operation sites in and around protected areas and areas of high biodiversity value outside protected areas
Significant impact of activities, products, and services on biodiversity
Habitats protected or restored
IUCN Red List species and conservation listed species with habitats affected by operations
Emissions
Greenhouse Gas (GHG) emissions
Reduction of GHG emissions
Emissions of ozone-depleting substances (ODS)
Nitrogen oxides (NOx), Sulphur oxides (SOx) and other significant air emissions
Effluents and waste
Waste types and disposal methods
Significant spills
Transport of hazardous waste
Water bodies affected by water discharges and/or runoff
Environmental compliance
Non-compliance with environmental laws and regulations
Supplier Environmental Assessment
New suppliers that were screened using environmental criteria
Environmental impacts in the supply chain and actions taken
Sustainable operations

ISBN NUMBER: 978-0-620-99843-7

SOCIAL AND RELATIONSHIP CAPITAL

Information items as per GRI Standards (100, 200, 400 series)
Child Labour
Operations and suppliers at risk for incidents of child labour
Forced or Compulsory Labour
Operations and suppliers at risk for incidents of forced or compulsory labour
Ethics and integrity
Values, principles, standards, and norms of behaviour
Mechanisms for advice and concerns about ethics
Governance
Consulting stakeholders on economic, environmental, and social topics
Senior management hired from the local community
Procurement Practices
Proportion of spending on local suppliers
Anti-corruption
Operations assessed for risks related to corruption
Communication and training about anti-corruption policies and procedures
Confirmed incidents of corruption and actions taken
Anti-competitive Behaviour
Legal actions for anti-competitive behaviour, anti-trust, and monopoly practices
Rights of Indigenous Peoples
Incidents of violations involving rights of indigenous peoples
Human Rights Assessment
Operations that have been subject to human rights reviews or impact assessments
Employee training on human rights policies or procedures
Local Communities
Operations with local community engagement, impact assessments, and development programs
Operations with significant actual and potential negative impacts on local communities
Compliance with laws and regulations in the social and economic area
Transformation initiatives
Supplier Social Assessment
New suppliers that were screened using social criteria
Negative social impacts in the supply chain and actions taken
Customer Relations
Assessment of the health and safety impacts of product and service categories
Incidents of non-compliance concerning the health and safety impacts of products and services
Substantiated complaints concerning breaches of customer privacy and losses of customer data
Customer data privacy policies and procedures
Other
Political contribution
Incidents of non-compliance concerning product and service information and labelling
Incidents of non-compliance concerning marketing communications
Brand management

ISBN NUMBER: 978-0-620-99843-7

Trust building and adding value to the stakeholders
Corporate social investment
Adding value to the customer

ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Reporting on the Sustainable Development Goals: Insights from South Africa

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ABSTRACT

Corporate Social Responsibility (CSR) requires businesses to impact society positively, including environmental, social, and economic impacts. The Sustainable Development Goals (SDGs) require action and engagement from businesses to be successful. This study analyses the sustainability or CSR reporting of the South African Top 40 listed companies on the Johannesburg Stock Exchange (JSE) to determine the level of engagement with the SDGs and the quality of SDG reporting. This study conducted a qualitative content analysis of the sustainability reporting of South African listed companies on the Johannesburg Stock Exchange in 2018, using the Top 40 by market capitalisation as a sample. All sustainability related reporting at a point in time was analysed in order to determine the extent of the SDGs reported and in light of specific quality criteria. This study finds that although most of the Top 40 are reporting on the SDGs and are therefore aware of them, the poor quality of SDG reporting points to low levels of engagement with the goals. The level of engagement is expected to increase in the future. This study concludes that companies will have to improve their level of SDG engagement to contribute to the success of the goals positively.

KEYWORDS

Corporate social responsibility; sustainable development goals; sustainability reporting

INTRODUCTION

The role of business has changed (Stout, 2012). Shareholder primacy has been replaced by a more stakeholder inclusive approach, in which organisations are being held more accountable for their impact on society and the environment (King, 2018). Elkington's (1998) notion of the Triple Bottom Line, in which a business should pursue environmental, social and economic issues, is more relevant today than ever before. This focus is required in order to succeed in their pursuit of corporate sustainability or their ability to meet current and future stakeholder needs (Dyllick & Hockerts, 2002).

Sustainability reporting, defined as how a company communicates the progress made in its pursuit of corporate sustainability to its stakeholders (Hahn & Kühnen, 2013), has gained traction in the business community as the role of business has changed. Sustainability reporting has been increasingly recognised as an essential factor contributing to corporate sustainability (Hahn & Kühnen, 2013). Furthermore, Hahn and Kühnen (2013) state that by disclosing sustainability information, companies aim to increase transparency, improve reputation and brand value, motivate employees and support corporate information and control processes. The stakeholder demand for sustainability information means that it is now essential for businesses to clearly and effectively communicate progress on their pursuit of corporate sustainability to meet the stakeholder needs (Global Reporting Initiative, United Nations Global Compact, & WBSCD, 2015).

Reporting on the Sustainable Development Goals (SDGs) has been a significant trend within sustainability reporting (Blasco, King, McKenzie & Karn, 2017). These goals, developed by the United Nations (UN), aim to stimulate action over the next 15 years as countries from all over the world will work together to pursue global sustainable development (United Nations General Assembly, 2015). The 17 goals tackle a wide range of global sustainability issues, which are universally applicable. Although 193 governments have signed up to pursue these goals, the private sector and businesses will play a pivotal role in achieving these goals. The UN has identified an underlying aim for companies worldwide to connect their strategies to the SDGs and engage with the objectives (Jones, Hillier & Comfort, 2016).

ISBN NUMBER: 978-0-620-99843-7

Prior research conducted by KMPG (2017) revealed that reporting on the SDGs among the world's biggest companies according to the N100 and G250 samples will become increasingly popular and valuable. Research has been looking at applying the SDGs in specific industries in South Africa, such as healthcare (Haywood, Wright, Wright & Private, 2019) and mining (Cole & Broadhurst, 2021). However, there has been limited research regarding SDG reporting across multiple sectors in South Africa and this study will compare the different sectors. South African businesses have had an opportunity to engage with the SDGs and align their strategies with these goals (Jones *et al*., 2016). Furthermore, as the new International Sustainability Standards Board (part of the IFRS Foundation) is currently developing new standards to address many aspects covered by the SDGs (IFRS Foundation, 2021), it is an opportune time to understand how the SDGs have been reported on in South Africa.

Therefore, this study will analyse South African companies' sustainability reporting to determine whether companies in South Africa are engaging with the goals and reporting on them effectively. This study will be done by conducting a content analysis of the sustainability reporting of South African companies, using the most significant 40 JSE listed companies by market capitalisation as a sample.

The remainder of this paper is set out as follows; the literature review will review past research conducted on sustainability accounting, the importance of sustainability reporting, the SDGs' development, and the degree of reporting on the goals. The paper will then describe the methodology used to analyse the extent and quality of SDG reporting by South African companies, followed by an in-depth analysis and discussion of the findings. The concluding remarks will follow recommendations for areas of future research.

LITERATURE REVIEW

Theoretical framework

Various accounting theories underpin sustainability reporting. Of these, legitimacy theory may provide insight into why companies may be embracing sustainability reporting and is one of the standard theories that has been used to explain sustainability reporting disclosures by companies (Dagilien, 2018; Daher & Bashatweh, 2018). Legitimacy theory recognises the dynamics and conflicts between different groups within society (Deegan,

ISBN NUMBER: 978-0-620-99843-7

2002). This theory proposes that it is impossible to properly assess economic problems without considering the impact of the broader political, social and institutional factors that affect them (Deegan, 2002). Legitimacy theory suggests that a "social contract" exists between a company and society (Deegan, 2002). The legitimacy theory indicates that for an organisation to continue to exist, it depends on societal resources and must be considered legitimate by society (Amran & Haniffa, 2011). Companies gain legitimacy by showing society that they are working within the limits of society (Kuzey & Uyar, 2017). One way to accomplish this is by publishing sustainability reports (Kuzey & Uyar, 2017). Therefore, embracing sustainability reporting is a strategy taken by companies to earn legitimacy and continue to exist in the future (Amran & Haniffa, 2011; Reverte, 2009).

Sustainability on the rise

Much had changed since the middle parts of the 20th century when the concept of shareholder primacy became entrenched. The tenet that a business' sole objective was to maximise shareholder's wealth by pursuing profits at all costs was generally accepted (King, 2018; Stout, 2012). At the turn of the century, asset owners and managers began to realise that companies with the sole objective of improving their bottom line would not survive in the long run. Society was starting to disapprove of companies that were negatively impacting society or the environment. As wireless and mobile communication began to gain momentum, so did the degree to which companies were held accountable for poor corporate citizenship (King, 2018).

In examining past research, numerous attempts have been made to define sustainability and Corporate Social Responsibility (CSR). One of the latest definitions adopted by the European Commission being "the responsibility of enterprises for their impacts on society … to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy" (European Commission, 2011:3). Corporate sustainability has been defined as "meeting the needs of a firm's direct and indirect stakeholders, without compromising its ability to meet the needs of future stakeholders as well" (Dyllick & Hockerts, 2002:131). Prior research states that a company needs to maintain its economic, social, and environmental capital base to achieve corporate sustainability (Dyllick & Hockerts, 2002; Montiel & Delgado-Ceballos, 2014). Corporate sustainability is what Elkington defines as the Triple Bottom Line (TBL) (Elkington, 1998). Therefore,

ISBN NUMBER: 978-0-620-99843-7

sustainability and CSR gradually converged (Hahn & Kühnen, 2013), and this paper will use these terms interchangeably.

Sustainability reporting and integrated reporting

Sustainability reporting is not a new form of reporting. Companies were engaging in voluntary sustainability reporting during the 1960s and 1970s, albeit mainly in Europe and the U.S. This type of reporting remains primarily voluntary today, resulting in many labels and names for reports of such a nature, such as Corporate Citizenship Report, Corporate Responsibility Report, Sustainable Development Reports, and Sustainability Reports (Hahn & Kühnen, 2013).

Sustainability reports were initially very isolated and only focused on one of the three aspects in the TBL, mostly being social or environmental. This was a result of the voluntary nature of sustainability reporting. Despite this, sustainability reporting has been increasingly recognised as an essential factor contributing to corporate sustainability (Hahn & Kühnen, 2013).

For this reason, organisations have attempted to provide guidelines for effective sustainability reporting, emphasising the TBL. In the late 1990s the Coalition for Environmentally Responsible Economies (CERES), together with UN Environment Program (UNEP), launched the Global Reporting Initiative (GRI). The GRI has published a framework with guidelines that attempt to develop accountability to support a business's pursuit of the TBL by suggesting standard disclosures for an organisation's management approach to sustainability. Researchers (Blasco *et al*., 2017; Hahn & Kühnen, 2013; Ioannou & Serafeim, 2014) have concluded that the GRI guidelines are the most influential set of guidelines for businesses to follow when reporting on sustainability issues. According to KPMG's 2017 Survey of Corporate Responsibility Reporting, 63% of N100 companies and 75% of G250 companies apply the GRI guidelines in their sustainability reporting (Blasco *et al*., 2017).

Despite the high level of application, Buhr, Gray and Milne (2014) state that the GRI has been far from successful in creating a level of accountability for an organisation's CSR. Although the environmental indicators suggested in the guidelines are widely considered helpful, the indicators for the economic and social pillars of the TBL lack inspiration. Hence,

ISBN NUMBER: 978-0-620-99843-7

sustainability reporting continued to remain isolated and not integrated. Hahn and Kühnen (2013) also conclude that the GRI guidelines do not focus on integrating all three aspects of the TBL.

Another reason for the failure of sustainability or CSR reporting is assurance or lack thereof. Buhr *et al*. (2014) state that since voluntary sustainability reporting does not have to be assured, they should be viewed cautiously; hence, their effectiveness and reliability are diminished. More recent research (Blasco *et al*., 2017) has found, however, that the assurance of CSR data has grown steadily since 2005. In the 2020 survey, over 50% of N100 companies had assurance for their CSR data for the first time, and the assurance by G250 companies remained significant at 71% (KPMG, 2020).

It was out of this frustration caused by the failures of voluntary sustainability reporting that Integrated Reporting (IR) was born. Together with the Prince of Wales, the GRI formed the International Integrated Reporting Council (IIRC) in 2009. The IIRC created the International <IR> Framework (the Framework), which aims to create a globally accepted framework for sustainability accounting, the output of which is the integrated report (International Integrated Reporting Council, 2013).

IR introduced the notion of integrated thinking. This new way of viewing value creation encourages businesses to report financial and non-financial information in an integrated fashion, revealing the impact on another (Perego, Kennedy & Whiteman, 2016). Eccles and Krzus (2010) summarised the value IR could create when they stated that it "has the potential to change how companies operate significantly and investors think. It shifts the focus from that of meeting short term financial goals to developing a long-term business strategy that not only commits to corporate social responsibility but also to a sustainable society" (Eccles & Krzus, 2010).

Businesses, which are often criticised for isolating sustainability issues from the rest of their business and failing to integrate day-to-day activities with a pursuit of sustainability (Gray, 2010) despite using GRI guidelines and other frameworks, can look to IR to solve this problem. By "making explicit the connectivity of information to communicate how value is created over time" (International Integrated Reporting Council, 2013), the IIRC seeks to

ISBN NUMBER: 978-0-620-99843-7

redeem the failures of the GRI and encourage acceptable and integrated sustainability reporting practices. The Framework clarifies that companies need to be explicit about how resources and relationships, collectively referred to as the capitals, are affected in the value creation process. By doing so, IR and, by extension, integrated thinking allows management and stakeholders to operationalise and better understand sustainability, ultimately improving sustainability reporting and stakeholder engagement (De Villiers, Rouse & Kerr, 2016). The IIRC merged with the Sustainability Accounting Standards Board in 2021 to form the Value Reporting Foundation (VRF) (VRF, 2021). To further emphasise the importance of integrated reporting, the VRF will be consolidated into the new International Sustainability Standards Board (ISSB) in 2022 (VRF, 2022).

Although CSR reporting has historically been a voluntary activity, this type of integration of financial with "non-financial" information is gaining traction in countries worldwide, many of which are encouraging CSR reporting through regulation or stock exchange guidelines (Blasco *et al*., 2017). The KPMG Survey of Sustainability Reporting (2020) found that 80% of the world's biggest companies integrate financial and non-financial data in the annual financial reports, compared to 78% in 2017 (KPMG, 2017). Since this type of reporting remains primarily voluntary, the form of reporting varies.

Buhr *et al*. (2014) found that communication and reporting on sustainability and CSR issues usually takes the form of a stand-alone sustainability report. However, some companies label it differently, as discussed previously, or companies may include sustainability reporting as part of their annual integrated reports. One may also find sustainability in other diverse forms of communication such as print advertisements, press releases and corporate websites (Buhr *et al*., 2014).

In preparing CSR or sustainability reports, businesses must be aware of global trends which affect their organisation. In the KPMG Survey of Corporate Responsibility Reporting 2017, the survey identified reporting on the SDGs as a significant emerging trend within CSR reporting globally. This paper aims to investigate the integration of SDGs into sustainability reporting. Further explanation of these goals follows in the next section.

ISBN NUMBER: 978-0-620-99843-7

The United Nations Sustainable Development Goals

According to the UN (2015), the SDGs are a solution to the immense challenges in today's world. Poverty, inequality, unemployment, violent extremism, terrorism, natural resource depletion, and climate change are just a few of the plights that threaten humanity's sustainability and planet earth. The UN see an immense opportunity to make progress in facing such challenges. The UN's 2030 Agenda for Sustainable Development is "a plan for action for people, planet and prosperity" (United Nations General Assembly, 2015b:3). The SDGs, effective from 1 January 2016, form part of this agenda and aim to stimulate action over the next 15 years in which 193 countries from all over the world will work together to pursue global development (United Nations General Assembly, 2015).

The SDGs build on the Millennium Development Goals (MDGs), another set of UN goals that spanned from the year 2000 until 2015. The MDGs provided an essential framework for development. Significant progress was made in this Framework in the race to end poverty. This Framework did not make progress across all goals, however, with improvement in some of the most vulnerable people in Africa, least developed countries and landlocked countries not being reached to the extent desired. The new agenda, therefore, builds on these MDGs and goes far beyond them. Where the MDG's prioritised issued faced by developing countries, the SDG framework is equally applicable to developed countries (Griggs *et al*., 2014). The SDGs set out a more comprehensive range of economic, social and environmental objectives and define means of implementation. Therefore, this new agenda has "unprecedented scope and significance" (United Nations General Assembly, 2015), containing 17 SDGs with 169 associated targets. The SDGs span issues such as poverty, gender inequality, climate change and promoting peaceful and inclusive societies for sustainable development (United Nations General Assembly, 2015).

Griggs *et al.* (2014) remarks on the importance of the quantifiable targets which accompany the goals. These 169 targets are essential for two reasons. Firstly, they can aim at a single social or environmental outcome without considering interactions between different SDGs. At the same time, other targets can deliberately address the interactions of the goals and targets. The targets provide guidance and mechanisms to deal with the trade-offs and synergies. Secondly, the numerous targets allow goals to be applied on multiple scales and across sectors (Griggs *et al*., 2014).

ISBN NUMBER: 978-0-620-99843-7

Past research has recognised the ambitious nature of these goals. Schmidt-Traub (2015) states in a working paper that no country is on track to achieve the SDGs based on current trends. He says that the significant levels of investment required to achieve the goals, especially by middle and low-income countries, makes achieving the SDGs a stretch for every country. Griggs *et al.* (2014), on the other hand, remarks that the broad scope of the SDGs across environmental, social and economic issues presents a threat to sustainable development as a result of the perceived trade-offs between particular socioeconomic development and global environmental sustainability.

The adoption of the goals by the UN and governments around the world runs the risk of suffering from "cockpit-ism": the dangerous illusion that top-down steering by governments and intergovernmental organisations can solve the global problems (Hajer *et al*., 2015). Hajer *et al*. (2015) note that the success of the SDGs depends on the mobilisation of new agents such as businesses, cities and civil society.

The sustainable development goals and business

The scale of the new agenda and its ambitious goals require specific and effective means of implementation. To ensure this, the UN uses a Global Partnership bringing together governments, the private sector and civil society to mobilise all available resources (United Nations General Assembly, 2015).

Of importance is the involvement of the private sector. Although governments will define what policies will drive change, businesses will need to align their strategies with government ambition to make the correct impact on society. As the PwC Global Sustainability and Climate Change Leader, Malcolm Preston, said, "Business, alongside government, has a very key role in driving the ability for a society to thrive…or not" (PwC, 2016c).

In the 19th Annual Global CEO Survey, conducted by PwC, 69% of CEO's said that government and regulators have a high or very high impact on business strategy and was found to be a top-three influencer of business (PwC, 2015). Companies, therefore, have a critical imperative to engage with the SDGs, namely that businesses that align their strategy

ISBN NUMBER: 978-0-620-99843-7

with national priorities will most likely maintain legitimacy and their social license to operate by both government and citizens (PwC, 2015).

In 2015, PwC conducted a global survey with businesses and citizens to get their early perspective on awareness of the SDGs and plans on implementing them into business strategy. The survey illustrated that SDG awareness amongst businesses was high in 2015, with 92% of companies surveyed stating that they were aware of the SDGs. The survey also revealed a lack of knowledge in how to engage with and implement the SDGs into business practice, as only 13% of businesses had identified the tools needed to do this and only 29% of business were setting goals and objectives to pursue SDGs (PwC, 2015). It seemed that companies were adopting a "wait-and-see" approach regarding implementing clear policies and strategies relating to the SDGs, although how long the “wait-and-see” approach will last is concerning, as research conducted globally in 2021 continued to find low levels of engagement with the SDGs (Heras-Saizarbitoria, Urbieta & Boiral, 2021).

From a South African perspective, only 31 South African businesses responded to the survey. The survey also found SDG awareness high, with 87% of companies indicating that they were aware of the goals. However, only 3% had identified tools to engage with the SDGs, and only 26% of businesses were setting SDG related goals. It was evident in 2015 that South African companies were not distinct from their global partners, all of whom needed to take action and put clear steps in place to engage with the SDGs (PwC, 2016b).

Although decisive action had not yet taken place at the time of the survey, the SDGs can radically change business as the world knows it. Malcom Preston (2016) speaks about how the SDGs can drive a change in business approach from prioritising shareholders to prioritising stakeholders. The focus of business and strategy is moving towards creating long term sustainable value. Therefore, the SDGs offer a road map for good business growth and actual value creation over the next 15 years.

The PwC SDG Engagement Survey (2015) asked business to rank the top five SDGs on which they believe their business has the highest impact. At the same time, the survey asked citizens which of the goals they deemed to be the most important ones for companies to pursue. Figure 1 summarises these results.

ISBN NUMBER: 978-0-620-99843-7

Figure 1: South African priorities (PwC, 2015)

Figure 1 demonstrates the disparity that exists between businesses and citizens in South Africa. Companies viewed SDG 8: Decent work and Economic Growth as the goal in which they believe their business makes the most significant impact, while citizens prioritise Zero Hunger, No Poverty and Clean Water and Sanitation, none of which feature in business top 5 results.

The results illustrate one of the challenges facing the role of businesses pursuing the goals. Jones *et al*. (2016b) suggest that companies are "cherry-picking" the SDGs they want to address and ignoring the others that do not meet their corporate responsibilities. PwC (2015) found that only 1% of companies surveyed planned to assess their impact on all 17 goals holistically. One may argue that not all 17 SDGs are relevant to every business, but only 34% of companies said they planned to assess their impact on all SDGs pertinent to their business.

The survey also showed a concerning trend of some goals consistently failing to be prioritised highly across industries. SDG 14 (Life below water), SDG 10 (Reduced

ISBN NUMBER: 978-0-620-99843-7

inequalities), SDG 1 (No poverty), SDG 2 (Zero hunger) and SDG 16 (Peace and justice and strong institutions) all failed to appear in the top 5 for over 80% of businesses surveyed.

PwC responds to such concerns by suggesting that self-interest is driving the selection of SDGs. The study found that "this vein of self-interest when prioritising SDGs extends through industry sectors" (PwC, 2015). It is clear from the survey that companies focus on SDGs in areas where they see growth and profits. The reality is that when business profits from addressing social issues, both business and society benefit simultaneously, which in turn creates scalable solutions and increases their legitimacy. Regardless of the business' motives behind engaging with the SDGs, the result is a tangible one.

Reporting on the sustainable development goals

Lise Kingo, CEO and Executive Director of United Nations Global Impact, said, "The SDGs provide a unique opportunity to elevate communication on sustainability." (PwC, 2016c). Kingo, along with many other leaders in sustainability reporting, sees the potential contained within the SDGs to impact corporate action as well as corporate reporting.

The SDGs themselves acknowledge the importance of reporting on sustainability issues. Target 12.6 mentions the benefits of sustainability reporting explicitly as a part of the pursuit towards goal 12 (Responsible Production and Consumption). Sustainability reporting frameworks encourage companies to include and integrate sustainability information into their reporting methodologies (PwC, 2016c).

Reporting on the SDGs was highlighted as an emerging trend in a survey of CSR reporting of 4 900 companies in 49 countries (Blasco *et al*., 2017). Only two years after the launch of the SDGs, it was clear from this survey that many businesses were taking the SDGs seriously, with 43% of G250 reporters and 39% of N100 reporters linking the goals to their CSR activity (Blasco *et al*., 2017). There were only three countries at the time of the survey where most of the top 100 companies referenced SDGs in their CSR reporting, namely Sweden, Portugal, and Mexico. Although this is an emerging trend, the results show that many large companies are still not yet linking SDGs to their CSR reporting. A clear overall trend has emerged in a short space of time, which strongly suggests that the SDGs will soon become more prevalent in CSR reporting (Blasco *et al*., 2017).

ISBN NUMBER: 978-0-620-99843-7

SDG reporting standards

At the time of this study, there were no standard benchmarks or frameworks for SDG reporting. However, many initiatives seek to establish such frameworks and standards (KPMG, 2018; PwC, 2016b). This literature review will explore one of the most pervasive frameworks currently used in practice, the SDG Compass, and analyse the results of a KPMG study on SDG Reporting.

The SDG Compass was released shortly after the ratification of the SDGs by the UN. It aimed to guide companies on incorporating the SDGs into their strategies and providing a framework for measuring and reporting their contribution to the SDGs. The SDG Compass gives guidance on understanding the SDGs. The SDG Compass prioritises SDGs, setting SDG related goals, integrating the SDGs within business strategy and reporting and communicating impact and SDG performance (Global Reporting Initiative, United Nations Global Compact, & WBSCD, 2015).

An additional document called "Business Reporting on the SDGs: An analysis of the goals and targets", developed by members of the GRI and UN Global Compact, with technical support from PwC, was one of the first sets of in-depth guidelines aimed at creating a harmonised methodology of engaging in and reporting on the SDGs. This analysis provides an inventory of possible disclosures for each SDG and each target. These possible disclosures include qualitative and quantitative disclosures developed from globally accepted disclosure frameworks such as the GRI Sustainability Reporting Standards and the Communication on Progress (COP) on the UN Global Compact Ten Principles and the SDGs (PwC, 2016c).

In February 2018, KPMG released a document called "How to Report on the SDGs: What good looks like and why it matters". This document was created due to a KPMG study aimed to help businesses unsure about what good SDG reporting should entail. KPMG has a long history of conducting surveys on the CSR reporting of companies all around the globe, which enables them to have a firm grasp on reporting behaviours of some of the largest companies in the world. This knowledge of sustainability reporting trends and practices helped professionals at KPMG to propose quality criteria for SDGs, which businesses can use as a

ISBN NUMBER: 978-0-620-99843-7

guide for their reporting (KPMG, 2018). This Framework offers nine quality criteria for assessing SDG reporting quality, grouped into themes of understanding, prioritisation and measurement (KPMG, 2018).

Concluding comments on the literature

Sustainability or CSR reporting is a critical aspect of an organisation's communication to stakeholders. Companies report on sustainability issues with guidance from the GRI and the VRF, encouraging reporting focused on the TBL. The SDGs are important considerations for a business' pursuit of its sustainability and corporate social responsibilities, as enterprises play a vital role in the success of the SDGs.

As seen above, the bulk of the research and analysis done on SDG reporting has been done large-scale, using global companies as samples. This paper looks to apply similar research to a South African context. This paper investigates whether South African companies are considering the SDGs and whether they are reporting appropriately on them.

METHODOLOGY

This study aims to assess first the extent to which South African companies are reporting on SDGs, and if so, secondly, the quality of this reporting. This study assumes that the quality of SDG reporting will improve over time as levels of engagement with the goals improve and analyse companies' reporting at a single point in time.

Sample

The largest 40 JSE listed companies by market capitalisation on 31 December 2017 are used as a sample for this study. The Top 40 compromises over 80% of all JSE listed companies' total market capitalisation and therefore comprised a significant portion of the JSE (Courtney Capital, 2013). This study analysed all the companies in this sample, and no companies were excluded. The analysis further requires companies to be categorised in terms of their sectors. Table 1 presents the sector classification of Top 40 companies, according to Fin24 (2018).

ISBN NUMBER: 978-0-620-99843-7

Table 1: Sector classification of Top 40 companies included in sample

Sector	Number of Top 40 Companies
Basic Materials	7
Communication	2
Consumer Cyclical	4
Consumer Defensive	4
Energy	1
Financial Services	13
Healthcare	2
Industrials	1
Real Estate	5
Technology	1

Data collection and analysis

This study collected data during May 2018. Data was collected from the most recently published public reporting (as at collection date) found in integrated reports, annual reports, sustainability reports and on a company's website. Buhr *et al*. (2014) found that these were the locations most companies reported on sustainability issues. This data collection pool is similar to the methodology used by other studies, which involved content analysis of a company's reporting practices (KPMG, 2018; Marx & Mohammadali-Haji, 2014). The most recently published integrated, annual and sustainability reports all happened to be reports for the 2017 financial year, apart from one company that had already published 2018 reports by the time of collection. This did not affect the study in any way because the company's extent and quality of SDG reporting in both years were identical.

Some companies which form part of the JSE Top 40 companies have a primary listing elsewhere, and their listing on the JSE is a secondary listing. Only companies with primary listings must produce integrated reports as part of the JSE listing requirements (Johannesburg Securities Exchange Limited, 2018). This study did not exclude those companies with primary listings elsewhere. This study retrieved data from alternative sources, such as sustainability reports and information published on the website.

ISBN NUMBER: 978-0-620-99843-7

This study used a content analysis method to gather data. This data collection method has been used extensively when analysing integrated reports and other reports published by companies (Vitolla, Raimo & Rubino, 2019).

This study uses a keyword search function to identify the extent of each company's SDG reporting. The specific words searched for were "Sustainable Development Goals", "SDG", "United Nations", and "Global Development Goals". This study applied the search function to each source of published reporting, namely the integrated report and sustainability report. These reports are available to download from each company's respective websites.

This study used the exact keywords on a company's website to identify any additional disclosures relating to the SDGs. Additionally, this study specifically analysed any information under the "Sustainability" tab because the effectiveness of built-in search functions differed between websites, and not all websites contained a built-in search function.

The data collected were analysed to determine the extent and, secondly, the quality of SDG reporting by the sampled companies. This study used Microsoft Excel to store and analyse the data.

The SDG disclosures of each company were analysed and received either a 0 or a 1 for each category as follows:

0: SDG reporting does not satisfy the category

1: SDG reporting satisfies category

Extent of SDG reporting

Each SDG reporting disclosure was analysed in terms of the extent of the reporting. This analysis examined whether SDGs are mentioned, the location of SDG reporting and the attempt to prioritise SDGs, the SDG reporting rate across sectors and whether having a primary listing outside of South Africa affects the extent of SDG reporting.

ISBN NUMBER: 978-0-620-99843-7

Quality of SDG reporting

In February 2018, KPMG released a document called "How to Report on the SDGs: What good looks like and why it matters". This Framework was developed by KPMG Sustainability Services, combined with the essential components of the SDG Compass and guidance from the IIRC. This Framework offers nine quality criteria for assessing SDG reporting quality, grouped into themes of understanding, prioritisation and measurement (KPMG, 2018) that were used to guide the assessment of the quality of SDG reporting. It is important to note that this is just one interpretation of quality, which this study used as a framework in determining the extent of SDG reporting. Table 2 below expands on this.

Table 2: Quality Criteria for the assessment of SDGs, based on KPMG (2018)

Understanding	
Business Case	Does the reporting demonstrate the business case for taking action on the SDGs?
CEO/Chair	Does the CEO and/or Chair's message talk about the SDGs?
Business Impact	Does the reporting assess the businesses's impact on the SDGs?
Prioritization	
Identification	Does the reporting identify priority SDGs for the company?
Methodology	Does the reporting explain the methodology the company used to prioritize the SDGs?
SDG Targets	Does the reporting identify specific SDG targets that are relevant to the business?
Measurement	
Business goals	Does the reporting disclose SDG performance goals for the company?
SMART goals	Does the reporting entity set SDG performance goals that are SMART?
Indicators	Does the reporting detail the indicators the company is using to measure the progress of its SDG activities?

Each of the nine quality criteria asks a specific yes/no question, as seen above. Good quality SDG reporting requires a company to perform well across all of the requirements. Each of the nine quality criteria and the reason for their relevance is discussed below.

The SDG Compass (Global Reporting Initiative, United Nations Global Compact & WBSCD, 2015) notes that by understanding the SDGs, companies will discover future business opportunities to create innovative solutions to sustainable development challenges and enhance the value created by their corporate sustainability. With a thorough understanding of the goals, businesses can use the SDGs as an overarching framework to shape and steer their strategies.

ISBN NUMBER: 978-0-620-99843-7

Therefore, businesses need to have a thorough understanding of the SDGs, and reporting should give stakeholders confidence that SDG activity is well planned and incorporated into a business strategy. For this reason, companies should be demonstrating the business case for pursuing SDGs. Reporting should show that SDG action is driven from the top of the organisation. The CEO or chairman should discuss the SDGs in their message to demonstrate such leadership. Understanding the SDGs should be accompanied by showing the positive and negative impacts a company has on the SDGs. Reporting on the impact a business has on the SDGs provides the transparency needed to regain the trust of stakeholders (KPMG, 2018). The priorities reflected in companies' management commentary indicate the preferences of the entire company (Herbert & Graham, 2020).

To benefit from the challenges and opportunities presented by the SDGs, the SDG Compass (Global Reporting Initiative, United Nations Global Compact & WBSCD, 2015) emphasises the importance of a company defining its priorities concerning the goals. It is important to note that not all 17 SDGs will be relevant and applicable to each business. Determining the extent to which a business's activities impact the goals depends on many factors. The process of assessing a business's impact on the goals (as part of understanding above) will enable businesses to identify which specific goals to prioritise correctly. Reporting on the methodology and processes used to determine the most relevant SDGs gives the prioritisation credibility. When businesses go over and above merely prioritising relevant SDGs and identify which of the UN's 169 targets are appropriate, it aids the company in determining the proper steps it needs to take to implement action (KPMG, 2018).

To demonstrate a commitment to pursuing SDGs, reporting should identify and measure SDG-related performance goals. By aligning goals with the SDGs, they become more meaningful and demonstrate a commitment to the SDGs and sustainable development. Setting goals that are specific, measurable, achievable, relevant and time-bound (SMART) is vital because it encourages shared priorities within the organisation, according to the SDG Compass. Defining SMART goals also ensures that a company can measure, monitor and communicate SDG progress with clarity. Defining and reporting on key performance indicators helps with this too, and companies should be selecting KPIs that directly address the impact and outcome of their activities. The Compass (2015) further recommends that

ISBN NUMBER: 978-0-620-99843-7

commonly used KPIs are used where possible, which will allow data to be compared across companies (Global Reporting Initiative, United Nations Global Compact & WBSCD, 2015).

Limitations

This analysis of SDG reporting is limited to the JSE Top 40 companies as of 31 December 2017 by market capitalisation. The SDG reporting by these companies may not represent the reporting of all South African companies. However, the Top 40 compromises over 80% of all JSE listed companies' total market capitalisation and therefore comprised a significant portion of the JSE (Courtney Capital, 2013). Although the literature widely recognises content analysis as a method to analyse the characteristics of a population (Ackers, 2009; Barac & Moloi, 2010), the small sample size does limit the extent to which inferences may be made about the whole population.

A single and specific framework has been used to assess the SDG reporting quality. This Framework is subjective because the satisfaction of some criteria, specifically whether SDG performance goals were SMART in nature, were left to the authors' judgment.

The SDGs have only been in implementation since the beginning of 2016. This means that many companies, like Anheuser-Busch Inbev and Woolworths, had not yet begun or were in the early stages of engaging with the goals at the time that data was collected. SDG reporting would have been done voluntarily as there is no legislative requirement for companies to apply the SDGs. For this reason, the observed sustainability practices and reporting encompassed the essence of the SDGs without explicitly mentioning the goals. To conclude that SDG reporting is poor does not necessarily infer that a company's sustainability reporting lacks.

FINDINGS AND DISCUSSION

The discussion of the findings will focus on the extent of SDG reporting by analysing whether companies are mentioning the SDGs in their reporting. The discussion will analyse the location of SDG reporting, the extent of reporting by different sectors and whether there is a difference in SDG reporting among companies with primary listings outside of South Africa. Following this, the KPMG (2018) quality criteria will be used to analyse the quality of SDG

ISBN NUMBER: 978-0-620-99843-7

reporting. Table 3 below demonstrates the findings for the extent and quality of the SDG reporting.

Table 3: Findings on the extent and quality of the SDG reporting by number of companies

		Extent:			
Reported or not?		If reported, where is it reported?			
Not reported	Reported	Elsewhere on website	SDG Report	Sustainability Report	Integrated Report
16	24	10	0	18	6
		Quality:			
		Understanding:			
		If reporting, is there understanding?			
		Business Impact	CEO/Chair	Business Case	
		13	5	15	
		Number of companies per number of understanding criteria met			
		0 of 3 criteria	1 of 3 criteria	2 of 3 criteria	3 of 3 criteria
		7	5	8	4
		Prioritisation:			
		If reported, is it prioritised?			
		SDG Targets	Methodology	Identification	
		2	2	16	
		Number of companies per number of prioritisation criteria met			
		0 of 3 criteria	1 of 3 criteria	2 of 3 criteria	3 of 3 criteria
		8	14	0	2
		Measurement:			
		If reporting, is it measured?			
		Specific Indicators	SMART goals	Business goals	
		0	2	5	
		Number of companies per number of understanding criteria met			
		0 of 3 criteria	1 of 3 criteria	2 of 3 criteria	3 of 3 criteria
		19	3	2	0

Extent of SDG Reporting

Reporting on the SDGs

Companies were deemed to be reporting on the SDGs if they mentioned the goals in either the integrated report, sustainability report or elsewhere on their website. Of the Top 40 companies, 24 reported on the goals, while 16 provided no disclosures relating to the SDGs anywhere in the four sources considered. Given that the sources investigated were encompassing, it would be a fair assumption to make that these companies were either not

ISBN NUMBER: 978-0-620-99843-7

aware of the SDGs at the time or attached such little importance to them that they omitted them entirely from their reporting practices.

This shows that 60% of the Top 40 companies are at least aware of the SDGs. Unfortunately, many companies did not go further than merely mentioning the SDGs (see prioritisation section below). Some companies disclose that the reason for this is that a strategic response will be formulated over time as the SDGs had only been in effect for three years. Other companies admitted to being at the beginning of the journey of aligning their strategies to the goals.

Location of reporting on the SDGs

The location of reporting of the SDGs for the sample companies was analysed. It was noted that some companies provided disclosures in more than one place.

Interestingly, only 25% (6 out of 24) of reporting companies reported on SDGs in their respective annual integrated reports. The majority of SDG reporting was found in sustainability reports (18 out of 24: 75%). These results are concerning as it points to businesses viewing SDGs as a confined issue that forms an isolated part of a company's value creation process rather than a pervasive issue, to be integrated throughout all aspects of a business. Furthermore, as an integrated report should, and typically do, contain the material elements of a company's activities (Herbert & Graham, 2020) companies are not viewing the SDGs as material issues. These echo the concerns raised by Hahn and Kühnen (2013) that companies fail to integrate social and environmental issues with economic and financial matters to pursue the TBL. IR aims to address this concern, so it is worrying to note that so few companies include the SDGs in their integrated reports.

A significant 42% (10 out of 24) of reporting companies reported on the SDGs in a separate location on their company websites. Half of these companies chose this to be the only location of SDG reporting and did not report on SDGs in either the integrated report or a sustainability report. This reporting is quite challenging to locate, and the fact that these companies do not include SDG reporting in published documents again points towards a lack of importance placed on these goals.

ISBN NUMBER: 978-0-620-99843-7

For those companies that mentioned the SDGs in a sustainability report and then commented on the goals again elsewhere on the company's website, it seemed like there were two different reporting activities. The SDGs that the sustainability report prioritises differed from those the website prioritises. This fragmentation and inconsistency illustrate a lack of connectivity and flow, which affects the usefulness of information for users.

Sector Reporting

Of the 24 JSE Top 40 companies reporting on the SDGs, the reporting was spread across most sectors. Although the small sample size limits the usefulness of sectoral analysis, notable findings include 7 out of 13 companies in financial services reported on SDGs and 6 out of 7 companies in basic materials reported on SDGs. These findings suggest that companies involved in extracting metals and minerals from the earth are more aware of sustainability issues and hence see the importance of considering the SDGs connected with their activities. Two companies had impressive and high-quality SDG reporting in the financial service sector as both companies fulfilled more than half of the quality criteria. Although healthcare, industrials, and technology formed a small percentage of the Top 40, none of the companies in these sectors reported on SDGs.

Primary Listings

A comparison was made of the SDG reporting in companies with a primary listing on the JSE and companies with primary listings elsewhere. The results indicate that companies with a primary listing elsewhere are more likely to report on the SDGs. Nine out of the 11 companies with primary listings elsewhere reported on the SDGs (82%). In comparison, 15 out of 29 companies with their primary listings in South Africa reported on the SDGs (52%).

It is important to note that nine out of the 11 companies with primary listings outside of South Africa are primarily listed in Europe. The EU's directive on disclosure of non-financial information provides comprehensive guidelines on CSR reporting and encourages pervasive reporting on non-financial issues (Camilleri, 2015). This pressure from the EU on European companies could be a reason for the increased SDG reporting shown by non-South African companies.

ISBN NUMBER: 978-0-620-99843-7

Conclusion on the extent of SDG reporting

Although 24 out of 40 companies report on the SDGs, many companies merely mentioned SDGs without further engagement. Therefore, the next section will analyse the quality of SDG reporting by the 24 reporting companies.

Reporting Quality

The KPMG (2018) quality criteria assess a company's understanding, prioritisation and measurement of the SDGs. Applying these criteria to the 24 JSE Top 40 companies reporting on SDGs illustrated that although some companies report on the goals, the overall quality is currently lacking, and there is room for improvement across all three areas.

Understanding

According to the first quality criteria, a business' understanding of the SDGs is assessed by asking three questions regarding the Business Case, the CEO/Chair and the Business Impact. The specific questions are: Does the reporting demonstrate the business case for engaging with the SDGs? Does the CEO or Chair's message talk about the SDGs? Does the reporting assess the business's impact on the SDGs? Table 3 demonstrates the results thereof.

Out of 24 reporting companies, 15 demonstrated the business case for the SDGs (63%). These results illustrate that most of the reporting companies understand the importance of the SDGs and see the value in addressing them. As stated previously, many companies did not go further than this step but noted that future SDG engagement would improve, leading to increased depth in SDG reporting.

Out of 24 reporting companies, 5 referenced the SDGs in the CEO/Chair message (21%). Both telecommunication companies in the Top 40 referenced the SDGs in the CEO/Chair message, and four out of the five companies doing this have primary listings in South Africa. The fact that only five out of 24 reporting companies fulfil this criterion speaks to the possibility that the leadership does not take enough responsibility for engaging with the SDGs or that this role has been delegated.

ISBN NUMBER: 978-0-620-99843-7

Out of the 24 reporting companies, 13 discuss the business' impact on the SDGs (54%). The study found that the reporting on business impact was unbalanced as nearly all companies fulfilling this criterion reported exclusively on the positive impact their business activities were having on the SDGs and ignored the negative impact. A one-sided view such as this could question the credibility of a company's SDG reporting (KPMG, 2018). This study also found that companies were blurring the line between impact and prioritisation, and many companies did not distinguish between them or treated them as one.

Table 3 also depicts an overview of the reporting companies scores for understanding SDGs by assessing the number of criteria satisfied. Understanding the SDGs plays a vital role in how a company reports on them, affecting the quality of SDG reporting.

As seen in Table 3, only 17% of reporting companies (4 out of 24) demonstrated a broad understanding by fulfilling all three criteria. 29% of reporting companies (7 out of 24) did not fulfil any of the criteria. Companies wanting to improve the quality of their SDG reporting should begin with broadening and solidifying their understanding of the goals and how their business activities impact them. Leadership should set this tone by demonstrating an understanding of the goals and ensuring long term support.

Prioritisation

The second quality criteria is Prioritisation. A business' prioritisation is assessed by asking: Does the reporting identify priority SDGs for the company? Does the reporting explain the methodology the company used to prioritise the SDGs? Does the reporting identify specific SDG targets relevant to the business? Table 3 demonstrates the results thereof.

Only 16 out of the 24 reporting companies (67%) prioritised relevant SDGs. As stated above, there was generally no distinction between the SDGs being impacted and which ones were being prioritised. There was no clear pattern evident as to the number of SDGs being prioritised. Most of the reporting companies prioritised between 7 and 12 goals. The highest observation was 16 of the 17 goals, while the lowest was only three.

Only two of the 24 reporting companies (8%) disclosed the methodology or process used to prioritise the most relevant goals. This result is most likely due to companies not generally

ISBN NUMBER: 978-0-620-99843-7

disclosing methodologies. A PwC study (2016a) revealed that only 13% of companies surveyed had identified the tools that would help them assess their impact on the SDGs. This finding suggests that companies do not have an effective and tested methodology to implement, and therefore do not have anything of value to disclose. As SDG reporting gains traction in the next years, methodologies and best practices are expected to improve and become more widely available.

The same two companies were the only two to have identified relevant targets out of the 169 targets set by the UN. The fact that so few companies have taken this step is concerning because engaging with these targets will improve a company's understanding, prioritising, and measuring of the SDGs.

This study showed that most companies (58%) could fulfil one of the criteria, namely identifying which of the SDGs is relevant to their business. Only two companies could meet more than one of the criteria, suggesting that companies should identify fewer SDGs that are most relevant to their business and analyse these SDGs in more depth, including identifying the appropriate targets within the relevant SDGs. Figure 2 below illustrates which reporting companies prioritised specific SDGs.

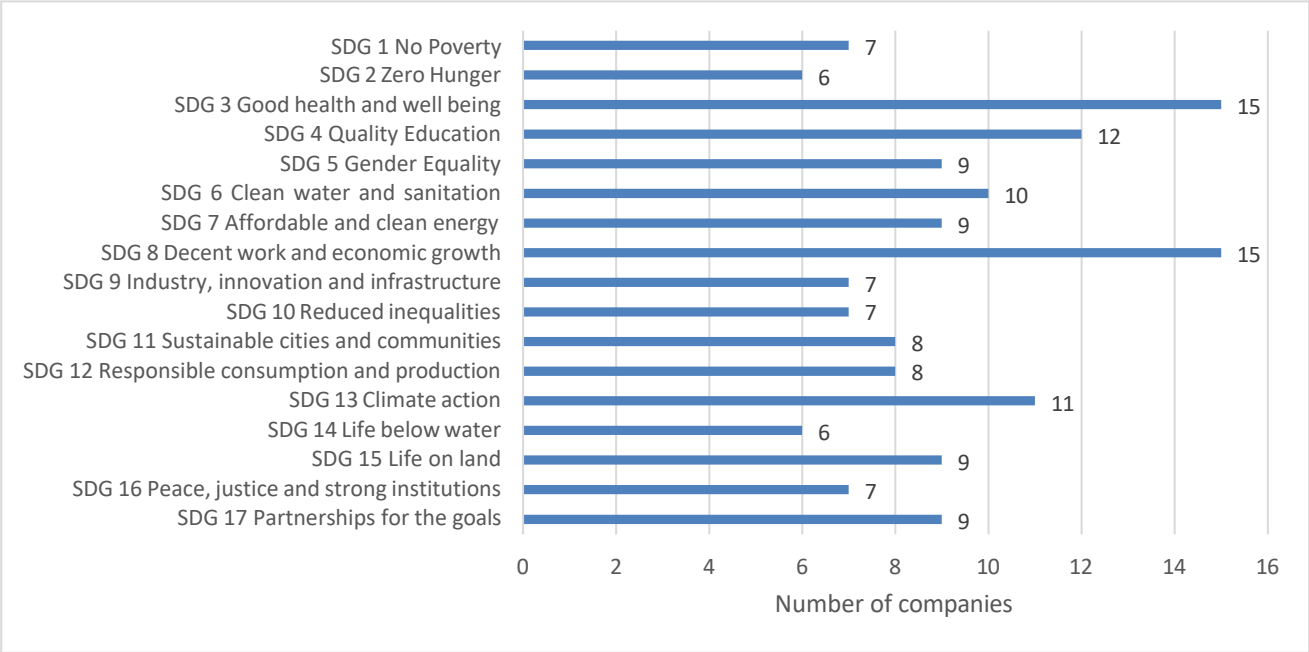

Figure 2 Number of companies prioritising each SDG goal

2022 Southern African Accounting Association National Virtual Conference Proceedings
ISBN NUMBER: 978-0-620-99843-7

This study has shown that the following SDGs were the most prioritised (in descending order): SDG 3: Good Health and Wellbeing; SDG 8: Decent Work and Economic Growth; and SDG 4: Quality Education. Prioritisation of these SDGs across all sectors makes sense in the light of the economic environment in which these companies find themselves. According to a PwC survey (2015), businesses from all regions globally ranked SDG 8: Decent Work and Economic Growth as the SDG offering the most business opportunity and on which they could have the most significant impact.

This study has shown that the following SDGs were the least prioritised (in descending order): SDG 2: Zero Hunger; SDG 14: Life Below Water; SDG 1: No Poverty; SDG 9: Industry, innovation and infrastructure; SDG 10: Reduced inequalities; SDG 16: Peace, Justice and Strong Institutions. These SDGs were prioritised by less than half of the 16 Top 40 companies that provided SDG disclosures. Even though the Top 40 is not fully representative of the South African market, it is concerning to see that these are the least prioritised SDGs because poverty and injustice are systemic issues faced by millions of South Africans. However, the government may address these SDGs better.

Regardless of the small sample size, this study can confirm findings by others (PwC, 2015) that SDG 2: Zero Hunger, SDG 14: Life Below Water and SDG 1: No Poverty are the SDGs being "left out in the cold" at the moment. Once companies have gained an increased perspective around how they impact SDGs, these far-out goals may begin to be included on corporate radars.

Measurement

The third quality aspect is measurement. A business' measure of the SDGs is assessed by asking the following questions: Does the reporting disclose SDG performance goals for the company? Does the reporting entity set SDG performance goals that are SMART? Does the reporting detail the indicators the company is using to measure the progress of its SDG activities? Table 3 depicts the results of the measurement analysis.

Only five out of 24 reporting companies (21%) reported on SDG specific performance goals. This number may not be beneficial because companies generally set sustainability goals and disclose them in their respective reports, but very few companies link the goals directly

ISBN NUMBER: 978-0-620-99843-7

to SDGs. A failure to fulfil this criterion does not necessarily infer that companies are not setting sustainability goals.

Out of the 24 reporting companies, only two (8%) set SMART goals for their SDG activity. Many business performance goals are placed within the SMART Framework (specific, measurable, achievable, relevant and time-bound). The issue here is that only five companies set SDG specific performance goals, and only two of those set goals were SMART.

No reporting companies reported on specific indicators used to measure their SDG performance. The GRI framework sets out specific indicators for sustainability issues, which many of the JSE Top 40 companies use (Global Reporting Initiative, 2015). In partnership with the SDG Compass, the GRI has updated their standards to include KPI's in terms of SDGs (Global Reporting Initiative, United Nations Global Compact, & WBSCD, 2015). Companies in the Top 40 did not define new and SDG-relevant indicators to measure SDG performance, which means they have not yet updated their sustainability disclosures in terms of the latest GRI guidance. These findings would be unlikely, though, when only 21% of companies set SDG specific goals.

Measuring performance towards SDGs is the category in which Top 40 companies were the least successful. Almost 80% of the reporting companies failed to fulfil any measurement criteria, as seen in Table 3. The relatively poor performance in the other two themes, understanding and prioritising the goals, shows that the Top 40 do not have a solid foundation for engaging with the SDGs. As these goals are a relatively recent development with which companies are grappling, the quality of reporting indicates that companies are still involved with understanding and prioritising the SDGs before developing specific and relevant goals and indicators of performance. However, this study has shown that the Top 40 companies on the JSE find it challenging to translate their well-intentioned support of the SDGs into explicit and practical business goals. These findings are similar to those findings by KPMG when they applied the quality criteria to the G250 sample (KPMG. 2018).

ISBN NUMBER: 978-0-620-99843-7

CONCLUSION

The paper analyses the extent of SDG reporting by South African companies. Despite South African companies' progress in sustainability reporting and their extensive use of IR, reporting on the SDGs is unimpressive. Although more than half of the Top 40 companies report on the SDGs, the quality and depth of reporting have room for improvement. The low level of engagement with the SDGs at the time of the study, may be a threat to the legitimacy of these companies. The extent and quality of SDG reporting are expected to improve. However, Top 40 companies admitted that aligning strategies and goals takes time, and over time engagement levels are expected to increase.

Findings show that 16 of the Top 40 companies failed to report on the SDGs and either chose not to report on them or at the time of the study were unaware of the goals. As limited as this may seem, the SDGs are relatively new concepts in the business community. As the pervasiveness of these goals increases, it is expected that many more companies will see their importance and take seriously their responsibility to help pursue the goals (Blasco *et al*., 2017).

Companies that take the act of reporting on the SDGs seriously will improve their levels of engagement with the goals. Therefore, it is recommended that companies strive to improve their depth and quality of sustainability reporting by reporting on these goals. The adoption of the new ISSB standards will also assist companies in these reporting goals.

However, this study can only make limited inferences about the SDG reporting of all companies, as the analysis of reporting was limited to the Top 40 JSE listed companies. Therefore, future research is possible and recommended to include more companies in the study in more recent periods, once the practice is established and using alternative frameworks to assess reporting quality.

The SDGs are merely a means to a better end, a means in which companies can play a vital role. Therefore, the authors urge companies to continue to engage with the goals and take seriously the responsibility that rests upon their shoulders.

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Circular Economy Disclosure by JSE Listed Mining Companies in South Africa

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ABSTRACT

The past few years have seen a significant increase in environmental related issues, the main ones being water shortages and climate change. Furthermore, in the mining sector, there has also been multiple incidents relating to waste produced, oil spills and an increase in greenhouse gas emissions. This has led to significant regulations and pressures on mining companies to disclose their environmental impact. The purpose of this study is to explore whether the Top 100 JSE listed mining companies incorporate or provide environmental rehabilitation provisions disclosures that is evidence of a circular economy (CE) logic. The study establishes a normative framework of how businesses could incorporate the circular economy approach as a strategic objective and provides a disclosure checklist to assess whether the companies environmental rehabilitation disclosures are reflective of a circular economy logic. The study achieves the purpose by performing a content analysis on disclosure from the integrated reports and sustainability reports of 13 mining companies and provide the total amount of disclosures that reflect a circular economy logic. The findings from the study show that Top 100 JSE listed mining companies disclose elements of the CE information in their integrated reporting and sustainability reports which is enabled by King IV, sustainability and integrated reporting principles. This study contributes to growing literature on reporting practices that promotes CE by

offering a first formal examination in Mining sector in South Africa of how integrated reports and sustainability reports can be used to communicate CE related information.

KEYWORDS

Circular economy; environmental disclosure; integrated reporting; normative framework; Provisions; sustainability reporting

INTRODUCTION

The 21st century has seen businesses under significant strain due to the effects of constrained natural resources (Ari & Yikmaz, 2019; Hawken, Lovins & Lovins, 1999; Ogbolumani & Nwulu, 2021), environmental issues (Geissdoerfer, Savaget, Bocken & Hultink, 2017b) and climate change (Dill, 2016; IOD, 2016)The ultimate effect of this has seen a substantial increase in environmental reporting, with sustainability reporting gaining greater momentum (Solomon & Maroun, 2012b).

King IV (IOD, 2016)[1] identifies these factors, as well as others, as the drivers of the Fourth Industrial Revolution and this emphasises the need for more sustainable reporting. King IV and the Integrated Reporting <IR> Framework propose prominently the need for integrated thinking to be deeply embedded in the way an organisation operates. Integrated thinking looks at the interconnectivity of an entity's operations and the six capitals (IIRC, 2021b). Natural capital has been significantly affected by companies' operations due to companies taking a linear economy stance when using resources (Geissdoerfer *et al*., 2017b).

The mining sector is one industry that has a huge environmental impact due to the nature of its operations (Carels, Maroun & Padia, 2013). This has resulted in the mining sector having a multitude of laws and regulations with which they have to comply, including the need to rehabilitate the environment after ceasing operations (Solomon & Maroun, 2012b). Amongst the regulatory compliance, the Global

1 King IV is the fourth iteration of the corporate governance framework of South Africa. It is voluntary for all companies in South Africa; however, all Johannesburg Securities Exchange (JSE) listed companies have to comply with it.

ISBN NUMBER: 978-0-620-99843-7

Reporting Initiative (GRI) Standards (GRI, 2020) along with the GRI G4 sector disclosure is the most common reporting applied (Carels *et al*., 2013). The GRI Standards promotes the 3R's (reusing, reducing and recycling). This is consequently the underlying premise for a different thought process on environmental management, namely the circular economy [CE] (Murray, Skenke & Haynes, 2015).

The CE paradigm has started gaining some attention in the current literature (Geissdoerfer *et al*., 2017b), however, it has not been fully analysed and incorporated into legislation (Murray *et al*., 2015). The purpose of this study is to apply the concept of the CE to South African mining companies. The research considers if *environmental rehabilitation provisions disclosures by companies reflect a circular economy logic?*

The remainder of this report is set out as follows. The next section looks at the theoretical background of the CE and developing a normative framework that will be used to evaluate the presence of CE disclosures. This is followed by the details of the methodology used, whereafter the results of the study is provided. The last section deals with the conclusion, areas of further research and limitations of the present research.

LITERATURE REVIEW

Reporting on sustainability information has become an important dimension of the corporate reporting paradigm (Solomon & Maroun, 2012a). Sustainability information should provide shareholders with a holistic view of an entity's performance and risks inherent in its operations (Gray, Kouhy & Lavers, 1995; IIRC, 2021a; Solomon & Maroun, 2012a). The need to complement financial information with details on social and environmental factors is part of a concerted effort to provide stakeholders with information necessary to make decisions about a reporting entity (De Klerk & De Villiers, 2012; De Klerk, Eccles & De Jongh *et al*., 2020; Eccles & Saltzman, 2011). Reporting of CE information is the one way an entity can respond to stakeholders' sustainability information needs which will reduce information asymmetry (Solomon & Maroun, 2012a).

ISBN NUMBER: 978-0-620-99843-7

Circular economy [CE]

There have been several definitions for the circular economy term in prior literature which were recently analysed in a study by (Kirchherr, Reike & Hekkert, 2017).The debate for a universal definition has contributed to the recent increase in research in the area of CE (Barnabe & Nazir, 2020; Barreiro-Gen & Lozano, 2020; Dagiliene, Frendzel, Sutiene & Wnuket-Pel, 2020; Fortunati, Martinello & Morea, 2020; Geissdoerfer *et al*., 2017a). For the purposes of this study CE is understood in line with a definition in a study by (Geissdoerfer *et al*., 2017a) which defined CE as

> *a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, and repair, reuse, remanufacturing, refurbishing, and recyclin*g.

The ultimate goal is for natural resources to have a long life which is most important given that natural resources are limited (Kraaijenhagen, Oppen & Bocken, 2016). This represents a paradigm shift away from viewing the environment as providing unlimited resources (Preston, 2012).

The CE, at its most fundamental level, is to use the environment in a way that results in little to no harm being present in the environment after a business ceases its operations (Murray *et al*., 2015). This seems to align with the definition of sustainable development as per King IV, which is development that meets present needs without compromising future generations' ability to meet their needs (IOD, 2016). One of the inherent limitations is that sustainable development looks at the triple context[2] whereas the CE strictly focuses on the environment and ignores the social dimension (Murray *et al*., 2015). There has been studies that have attempted to incorporate the social aspects in CE (Frey & Stutzer, 2001; Webster, 2015) however the conceptual integration of the social aspect into CE is still unclear (Geissdoerfer *et al*., 2017a). It is

2 The triple context refers to the impact that businesses have on society, the environment and the economy. It also states that the 3 are not mutually exclusive of each other, but are inexplicably linked IOD 2016. King IV Report on Corporate Governance in South Africa. *In:* AFRICA, L. N. S. (ed.) *Johannesburg, South Africa*..

ISBN NUMBER: 978-0-620-99843-7

for this reason that the current study is limited to the environmental aspect and ignores the social dimensions in its definition of CE as envisioned by Murray *et al*. (2015). Furthermore, Murray *et al*. (2015) identifies the CE as a strategy that can be employed by companies in order to help achieve sustainability.

Another inherent limitation is that a complete CE may not be completely attainable as resources and materials cannot be reused indefinitely and recycling may eventually become more costly and require more energy than the benefits it would provide (Geissdoerfer *et al*., 2017b). Even though there are limitations, China included the CE in its five-year plans (Murray *et al*., 2015), the European Commission has a CE action plan (Commission, 2011) and South Africa has also started to evaluate the CE (Fuesgen, 2017). It is clear that the CE is both relevant and applicable to the modern economy and the mining sector due to the sectors continuous plans to restore and rehabilitate the land and manage environmental impact (Marais & De Lange, 2021).

Circular economy reporting

Sustainability information has been attracting increasing research interest as a key instrument for communicating economic, environmental, and social information that has elements of CE logic (Janik, Ryszko & Szafraniec, 2020). There has been a number of guidelines for sustainability reporting the UN Global Compact (Communication on Progress), the OECD Guidelines for Multinational Enterprises and the ISO 26000 (International Standard for Social Responsibility) with the GRI Sustainability Reporting Standards being the most internationally accepted and trusted (GRI, 2020; Hojnik, Biloslavo, Cicero & Cagnina, 2020; Janik *et al*., 2020). The current study accordingly identifies sustainability reports as an important tool that organizations uses to communicate CE related information (Janik *et al*., 2020).

There have been increased calls for a comprehensive and integrated approach to reporting on information on CE (Abeysekera, 2013; Foundation, 2013). These calls have identified the importance of not only reporting the data but to disclose the interconnectedness of the CE elements with the organization's strategy (Kunc, Barnabe & Giorgino, 2020). This study acknowledges the importance of integrated reports developed in line with the principles of the International Integrated Reporting

ISBN NUMBER: 978-0-620-99843-7

Council (IIRC) have been identified in previous studies on CE, as an important tool for disclosing CE related information since the increased focus on environmental and social information (Eccles & Saltzman, 2011; Kunc *et al*., 2020,).

Integrated reports use a principles-based approach which is similar to the reporting practices for CE information, accordingly this study identifies integrated reports as a tool used to communicate CE information (Velte & Stawinoga, 2017). Additionally, IIRC reporting practices is now an established tool for communicating information in using visual, text and narrative (Barnabe & Nazir, 2020). Given that circular economy has started to be integrated into corporation's sustainability agenda, sustainability and integrated reports are increasingly being used as instruments to communicate information that has circular economy logic (Stewart & Niero, 2018). Aided by the fact that sustainability reporting has become a well-entrenched practice in the mining sector, an evaluation of sustainability reports and integrated reports in the mining sector for circular economy logic is most appropriate at this time (Böhling, Murguía & Godfrid, 2019; Mahmood & Orazalin, 2017).

To evaluate whether mining companies provide some form of CE disclosure when reporting rehabilitation activities, one needs to understand the process and thinking employed by companies in preparing their assessment and reports. Due to the fact that South Africa does not have any legislation regarding the circular economy or how to incorporate it into a company's operations and rehabilitation (Fuesgen, 2017), a normative framework is developed using the principle from King IV and the IIRC Framework.

Figure 1 illustrates the process that a company would follow when incorporating the CE into their operations.

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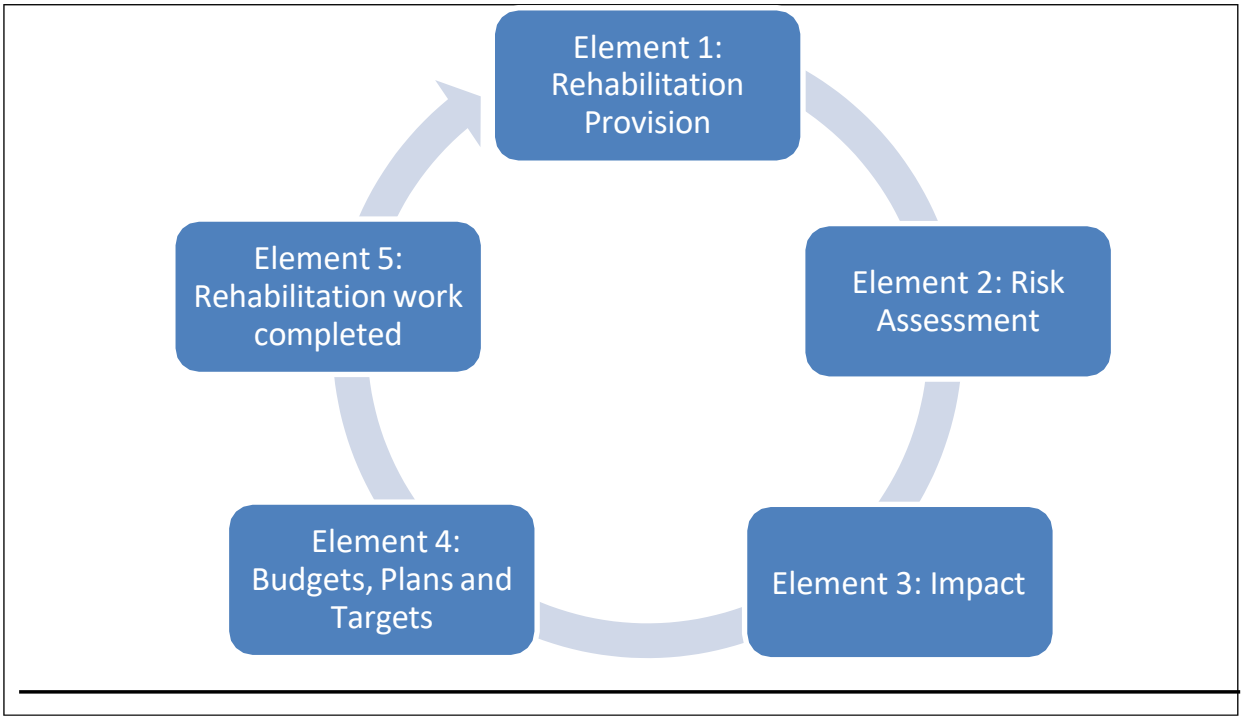

Figure 1: Normative framework for assessing the circular economy

The CE represents a strategic objective that companies want to achieve (Murray *et al*., 2015). Element 1 looks at the financial consequences as per the International Financial Reporting Standards (IFRS). This encompasses the amounts expected to be applied for the restoration and rehabilitation as per International Accounting Standard (IAS) 37 Provisions, Contingent Liabilities and Contingent Assets (IASB, 1998) as well as the amount of resources and reserves that the companies mine or expect to mine, as per IFRS 6 Exploration for and Evaluation of Mineral Resources (IASB, 2004), and how it affects the rehabilitation required.

Following on to King IV, due to the CE being linked to strategy, it forms part of integrated thinking. This means that companies would have to assess the risks (Element 2) that their operations pose to the environment and evaluate the impact (Element 3) it would have (IOD, 2016). From this point, management of the companies would then set policies and plans that would give rise to achieving a CE flow (Element 4). This would include both looking at overall policies to reduce the entire operations impact on the environment as well as specific policies for managing and mitigating environmental consequences due to the rehabilitation.

ISBN NUMBER: 978-0-620-99843-7

Element 5 deals with reporting the rehabilitation completed and how much of a CE strategy was achieved. This element would include actual financial amounts from IAS 37, policies for monitoring outcomes and performance of the plans (IOD, 2016), and setting out the non-financial aspects in the integrated report (IASB, 1998). It should be noted that the elements need not be dealt with in the order listed as some work together and that this is an iterative process to be applied by companies.

METHODOLOGY

In order to provide insights into the circular economy direct and indirect disclosure practices of mining companies listed on the JSEs top 100 companies, the study relied on a qualitative content analysis performed on sustainability, supplementary and integrated reports. This was done in line with prior studies which found large listed companies to be at the forefront of sustainability and integrated reporting (Dissanayake, Kuruppu, Qian & Tilt, al., 2020; Gunarathne & Lee, 2019). Further motivated by studies that found sustainability and integrated reports to be important vehicles for reporting on circular economy information (Eccles & Saltzman, 2011; Janik *et al*., 2020; Kunc *et al*., 2020).

Sample size

The study selected a sample made up of all 13 mining companies listed on the JSEs top 100 companies on 01 June 2018, who had all published integrated reports for the 2017 reporting year. These companies were selected because they are large mining companies which are required to comply with King IV and they have a greater environmental impact (Carels *et al*., 2013).The research concentrated CE disclosures in the integrated or annual reports, sustainability reports, sustainability development reports and supplementary reports. Table 1 identifies all the companies selected. The choice to focus the study to the mining sector was due to this sector being cited as the largest contributor to the cost of environmental impact in South Africa (Matshusa & Makgae, 2017). Furthermore the mining sector is South Africa is cited as the highest contributor to mercury emissions in Africa due to the coal and gold mines (Fayiga, Ipinmoroti & Chirenje, 2018). Given that the use of CE has increasingly been cited as one of the ways to reduce emissions, the mining sector was deemed to be most relevant and suitable for the study (Janik *et al*., 2020). The reports of all 13 companies

ISBN NUMBER: 978-0-620-99843-7

included in the final sample were obtained and analysed in accordance with the disclosure checklist detailed above (Janik *et al*., 2020). The study relied on all sustainability, supplementary and integrated reports available for the 13 companies for the 2017 reporting period, the use of 2017 reports is consistent with prior studies on integrated reporting (Nwachukwu, 2021; Vitolla, Raimo, Rubino & Garzoni, 2020). Integrated reports were found for each of the company in the research sample as a result, a total of 13 integrated reports were analysed. A total of nine sustainability reports, two supplementary reports and three sustainability development reports were collected from the respective companies website in a pdf format. The first step was to identify whether companies included or were aware of the CE. This was done by searching the words 'circular economy' in the above-mentioned reports and identifying and analysing any CE disclosures.

Table 1: List of companies

Number	**Name**	**Year-End**
Company 1	Glencore Xstrata Plc	31 December 2017 Integrated report and sustainability report
Company 2	BHP Billiton Plc	30 June 2017 Integrated report and sustainability report
Company 3	Anglo American Plc	31 December 2017 Integrated report and sustainability report
Company 4	Sasol Limited	30 June 2017 Integrated report and Sustainability development report
Company 5	South32 Limited	30 June 2017

ISBN NUMBER: 978-0-620-99843-7

Table 1: List of companies		
Number	**Name**	**Year-End**
		Integrated report and Sustainability development report
Company 6	Kumba Iron Ore Limited	31 December 2017 Integrated report and sustainability report
Company 7	Anglo American Platinum Corporation Limited	31 December 2017 Integrated report and sustainability report
Company 8	AngloGold Ashanti Limited	31 December 2017 Integrated report and Sustainability development report
Company 9	Exxaro Resources Limited	31 December 2017 Integrated report and Supplementary report
Company 10	Assore Limited	30 June 2017 Integrated report and sustainability report
Company 11	Gold Fields Limited	31 December 2017 Integrated report and sustainability report
Company 12	African Rainbow Minerals	30 June 2017

ISBN NUMBER: 978-0-620-99843-7

Table 1: List of companies		
Number	**Name**	**Year-End**
		Integrated report and sustainability report
Company 13	Sibanye Gold Limited	31 December 2017 Integrated report and Supplementary report

Data collection instrument

The normative framework was used to analyse the disclosures in the sample companies' integrated reports. Table 2 contains axial codes used each of which refer to an element in the reporting framework discussed in the literature review.

The first axial code relates to the financial quantification of the provision and reserves and represents compliance with IFRS. The second axial code relates to the risk assessment process and represents King IV compliance. These relate to risks that should be identified and disclosed for a CE to become integrated as part of the business. The third axial code relates to estimating the impact of the companies' operations with regards to each of the risks and these are mainly informed by GRI Standards. The fourth axial code relates to policies and plans. This return to King IV disclosures as these represents the policies that should be in place in order to monitor and continuously assess how well the company is achieving its CE targets. The last axial code relates to what should be disclosed with regards to the actual rehabilitation and level of CE integration achieved. These are mainly informed by IFRS and GRI Standards. The coding instrument concentrated on social and environmental information from the guidance provided by the GRI and IASB (GRI, 2020; Marcia, Maroun & Callaghan, 2015).

ISBN NUMBER: 978-0-620-99843-7

Table 2: Disclosure checklist based on the circular economy

Open Code	Disclosure	Source
AXIAL CODE 1 – REHABILITATION PROVISION		
Disclosure 1	Carrying amount of the provision at the beginning and end of the year	IAS 37
Disclosure 2	Additions/increases to the provisions	IAS 37
Disclosure 3	Amounts used during the period	IAS 37
Disclosure 4	Unused amounts reversed	IAS 37
Disclosure 5	Increase in the provision due to discounting	IAS 37
Disclosure 6	Nature and the expected timing of the provision	IAS 37
Disclosure 7	Uncertainties and major assumptions used	IAS 37
Disclosure 8	The discount rate used and adjustments for risks identified	IAS 37/ ZWM
Disclosure 9	Amount of resources and reserves	IFRS 6
Disclosure 10	Changes in estimates for reserves and resources	IFRS 6
AXIAL CODE 2 – RISK ASSESSMENT		
Disclosure 11	Overview of environmental risk related to the provision	King IV
Disclosure 12	Key areas of environmental focus/ significant environmental risk areas	King IV
Disclosure 13	Overview of legal and regulatory compliance	King IV/ GRI 307
Disclosure 14	Links between rehabilitation and reserve extraction	IAS 37/ IFRS 6
Disclosure 15	Risks from materials used in the operations and rehabilitation	GRI 301/ GRI G4
Disclosure 16	Energy risk due to sources and usage areas	GRI 302
Disclosure 17	Risk related to water including withdrawals and usage area	GRI 303

ISBN NUMBER: 978-0-620-99843-7

Disclosure 18	Water bodies affected by operations and activity/ High risk water areas	GRI 303
Disclosure 19	Biodiversity risk and scale of biodiversity impact (including red list species)	GRI 304
Disclosure 20	Types of the emissions by the business and source of emissions	GRI 305
Disclosure 21	Analysis on carbon footprint of the business	GRI 305
Disclosure 22	Types of waste produced and the risk they pose	GRI 306
Disclosure 23	Risk of significant spills	GRI 306
AXIAL CODE 3 – IMPACT		
Disclosure 24	Amount paid for rehabilitation during the period	IAS 37
Disclosure 25	Penalties incurred for non-compliance of environmental legislation	King IV/ GRI 307
Disclosure 26	Legal proceedings regarding alleged non-compliance with environmental legislation	IAS 37/ GRI 307
Disclosure 27	Land newly disturbed by operations and spills	GRI G4
Disclosure 28	Total recycled materials used and cost savings	GRI 301
Disclosure 29	Total energy used and efficiency achieved	GRI 302
Disclosure 30	Total energy reduction	GRI 302
Disclosure 31	Total water withdrawn, used and disposed	GRI 303
Disclosure 32	Water bodies affected by runoffs	GRI 303

ISBN NUMBER: 978-0-620-99843-7

Disclosure 33	Amount of habitats and biodiversity affected	GRI 304
Disclosure 34	Total emissions by source, type and scope	GRI 305
Disclosure 35	Significant GHG emissions and reductions	GRI 305
Disclosure 36	Total waste produced, recycled and disposed	GRI 306
Disclosure 37	Total amount of spills and related costs	GRI 306
Disclosure 38	Ecological damage due to failures and spills	AM
AXIAL CODE 4 – PLANS, BUDGETS AND TARGETS		
Disclosure 39	Areas of planned future focus for rehabilitation	King IV
Disclosure 40	Policies for monitoring compliance and management strategy	King IV/ GRI 307
Disclosure 41	Policies for rehabilitation and land expected to be rehabilitated	King IV/ GRI G4
Disclosure 42	Plans for the amount of recycled materials used and breakdown of usage areas	GRI 301
Disclosure 43	Energy reduction initiatives	GRI 302
Disclosure 44	Types of energy used and targets for energy usage	GRI 302
Disclosure 45	Policies for water conservation and reduction initiatives for water withdrawn and sources	GRI 303
Disclosure 46	Water disposal policies and breakdown of hazardous/ non-hazardous and recycling policies	GRI 303
Disclosure 47	Biodiversity recovery plans and initiatives	GRI 304

ISBN NUMBER: 978-0-620-99843-7

Disclosure 48	Targets for emissions and reduction initiatives/ Climate change initiatives	GRI 305
Disclosure 49	Waste disposal policies and transportation of waste	GRI 306
Disclosure 50	Policies for managing and containing significant spills	GRI 306
Disclosure 51	Increase in scope of rehabilitation	AM
Disclosure 52	Key Performance Indicators (KPI) based on percentage completion of rehabilitation	King IV/ SM
Disclosure 53	KPI's based on meeting specific benchmarks from above	King IV/ SM
Disclosure 54	Rehabilitation trust funds or rehabilitation specific investments	SM
AXIAL CODE 5 REHABILITATION		
Disclosure 55	Total amount spent on rehabilitation	IAS 37
Disclosure 56	Total amount of land rehabilitated	GRI G4
Disclosure 57	Percentage recycled inputs used for rehabilitation and operations	GRI 301
Disclosure 58	Percentage of energy used in rehabilitation	GRI 302
Disclosure 59	Percentage reduction in energy and use of renewable energy	GRI 302
Disclosure 60	Water bodies rehabilitated due to runoffs and significant withdrawals	GRI 303
Disclosure 61	Percentage of water used in rehabilitation/ Percentage of water recycled	GRI 303
Disclosure 62	Outcome of biodiversity recovery plans and initiatives	GRI 304

ISBN NUMBER: 978-0-620-99843-7

Disclosure 63	Total amounts of habitats restored	GRI 304
Disclosure 64	Assessment of environment quality post-rehabilitation	GRI 304/ SM
Disclosure 65	Percentage emissions from rehabilitation	GRI 305
Disclosure 66	Decrease in GHG emissions and carbon footprint	GRI 305
Disclosure 67	Percentage waste produced and disposed/ disposal rate of solid waste	GRI 306
Disclosure 68	Percentage of waste recycled	GRI 306
Disclosure 69	Percentage of reserves extracted in the current year	IFRS 6
SOURCE ABBREVIATIONS		
GRI 301 – 307	Global Reporting Initiative's Environmental Standards (GRI, 2020)	
GRI G4	Global Reporting Initiative's G4 – Mining and Metals Sector Disclosure (Initiative, 2013)	
IAS 37	International Accounting Standard 37 – Provisions, Contingent Liabilities and Contingent Assets (IASB, 1998)	
IFRS 6	International Financial Reporting Standard 06 – Exploration for and Evaluation of Mineral Resources (IASB, 2004)	
King IV	King IV Report on Corporate Governance for South Africa (IOD, 2016)	

Table 2 also shows specific disclosures which have been grouped under the axial codes. Individual disclosures have been obtained from the GRI, King-IV and the IFRS dealing with environmental provisions. Each of these sources are used to construct the disclosure instrument because they are applied extensively by South African companies when preparing sustainability and integrated reports. Although the GRI, King IV and IFRS do not deal with the CE directly, the sources provide the primary discourse for describing and explaining sustainability-related issues in corporate

ISBN NUMBER: 978-0-620-99843-7

reports. As there are no frameworks dedicated specifically to CE reporting, the chosen sources provide an appropriate basis for the data collection instrument.

Data collection

Data was collected from the mining companies' 2017 integrated reports, sustainability/sustainability development and supplementary reports. Supplementary reports and sustainability development reports are prepared in accordance with the GRI standards and are used as a form of sustainability report by a number of mining companies.

A direct keyword (circular economy) was used to content analyse the reports selected in the study for direct reporting on circular economy. The next step was to perform a qualitative content analysis of IAS 37, IFRS 6, King IV and GRI disclosure requirement on each of the reports to identify indirect circular economy disclosure requirements which have been grouped into 69 subcategories (Ching, Gerab & Toste, 2013; Guthrie & Abeysekera, 2006; Janik *et al*., 2020). Examples of disclosure categories that were included in the final disclosure checklist can be found in table 2. For ease of analysis each of the 69 disclosure categories were aggregated under 5 headings (adapted from IFRS principles, King IV principles and GRI standards) such as rehabilitation provision, risks assessment, impact, plans, budgets and targets and rehabilitation (See table 2). For every disclosure that the company had, a score of 1 was assigned. If the disclosure was not present, a score of zero was assigned. This approach has been used in prior studies exploring sustainability and integrated reporting (Adaui, 2020; Lock & Seele, 2016; Papoutsi & Sodhi, 2020). While collecting the data from the integrated and sustainability report, only references and disclosures related to the environment and climate change were analysed any social or economic related disclosures were ignored (Murray *et al*., 2015). The reports were independently coded by two researchers, who discussed differences with an experienced researcher in integrated reporting (Marcia *et al*., 2015).

RESULTS

From the 13 companies analysed, only two companies made reference to the CE in their integrated reports and, two references were found in the sustainability reports.

ISBN NUMBER: 978-0-620-99843-7

Company 1 made a reference in respect to their commodities in the sustainability report:

> "We are working with industry associations to identify further ways in which we can contribute to the aims of the circular economy regarding commodities" (Glencore Xstrata Plc, Sustainability report, 2017).

Company 3 also made a direct reference to CE in the following statement:

> "The fourth industrial revolution' is having a disruptive impact on many business models, including the mining value chain. Technology provides exciting business opportunities to make a significant positive contribution in addressing some of the sector's social and environmental effects: reducing safety risks, radically reducing water and energy usage, and facilitating the move to a 'circular economy'" (Anglo American Plc, Integrated report, 2017).

Company 4 made reference to the CE regarding the products they produce in the integrated report. They said, "we constantly strive to enhance the safety and health impacts and environmental performance of our products throughout the product lifecycle, and we drive a product philosophy that encapsulates the concepts of a circular economy". Company 12 made reference to the CE with regards to metals being capable of being indefinitely recycled therefore contributing to the CE and saving energy.

No other companies made reference to or acknowledged the CE. The study highlights a significant lack of direct circular economy related information disclosure in the integrated and sustainability reports. This is consistent with the findings by Gunarathne *et al*. (2021) which identified a significant lack of direct circular economy information in developing economies. The analysis indicates that steps must be taken to improve reporting of circular economy information to the stakeholders which can be done through increased awareness about circular economy principles and how they could be integrated to corporate operations and reporting (Vieira & Radonjič, 2020).

The study acknowledges that there is no regulated reporting framework for circular economy information in South Africa which might be the reason for the lack of direct

ISBN NUMBER: 978-0-620-99843-7

reporting of circular economy information. This view is consistent with findings from prior literature which made findings that regulation encourages more disclosure of circular economy information see (Gunarathne & Lee, 2019). Companies do not focus on reporting information that is not specifically required by legislation or global reporting frameworks. It must be noted however that a lack of direct reporting on circular economy information does not mean companies are not practicing circular economy activities and do not have strategies to report on CE information (Vieira & Radonjič, 2020). This view is reinforced by the presence of indirect elements of CE related information discussed below.

Table 3: The total frequency of each indirect CE disclosure

Row Labels	sum of total	sum of highest score obtainable
AXIAL CODE 1	130	130
AXIAL CODE 2	160	169
AXIAL CODE 3	155	195
AXIAL CODE 4	158	208
AXIAL CODE 5	123	195
Grand Total	**726**	**897**

Table 3 depicts the total number of observed CE disclosure for all 13 companies in each of the axial codes in the sum of total column. The sum of the highest score obtainable column represents the total disclosure items obtainable by all companies as per the disclosure checklist in table 2. The findings of axial code 1 (rehabilitation provision) shows that all the companies comply with IFRS principles and effectively provide enough financial disclosure which has elements of CE information. This indicates that companies are in 100% compliance with the required reporting requirements of the IFRS. It is not the objective of this study to give an analysis or comment on the quality of the IFRS disclosure that has CE information elements, this can a gap filled by future studies. This finding is of interest to the regulators as it indicates the importance of ensuring strict compliance with the principles of the IFRS as they go below financial reporting but ensure other stakeholder needs such as that of circular economy information. For practitioners it is important to be aware that

ISBN NUMBER: 978-0-620-99843-7

financial reporting frameworks are likely to extend beyond financial reporting and as such the reporting strategies must take this into account.

Axial Code 2 (risk assessment),3 (impact) and 4 (plans, budgets, and targets) had high rates of disclosure of information required by King IV achieving 95% and 79% and 76% respectively. This indicates that by complying with King IV companies are currently achieving a level of circular economy disclosure [CED]. The high level of disclosure of corporate governance is consistent with the finding made by Manes-Rossi (2017) that companies focus on corporate governance required disclosure in their integrated reports. It is in the interest of companies to ensure compliance with corporate governance frameworks in their reporting strategies as it is a form of signalling good corporate governance to regulators. Corporate governance disclosure can also be seen in the context of it being used as a legitimacy tool that is incorporated in the reporting strategies.

Axial code 3 (impact) has a sufficient amount of disclosure at 79% of the disclosure observed, indicating that companies disclose the impact that their business has on the environment (Villiers & Alexander, 2014). The score here is also due to companies having litigations and penalties for items that do not relate to the environment; therefore, they were not included in the CE checklist.

The last axial code (rehabilitation) obtained the lowest score as 63% of the disclosure was observed. This was mainly due to companies being too generic when using the GRI Standards to report on their environmental impact from their operations. Companies paid very little attention to the rehabilitation taking place even though companies stated that they are committed to making rehabilitation an integral part of their business operation. Therefore, there is evidence to suggest that existing disclosures by companies do reflect a CE logic.

ISBN NUMBER: 978-0-620-99843-7

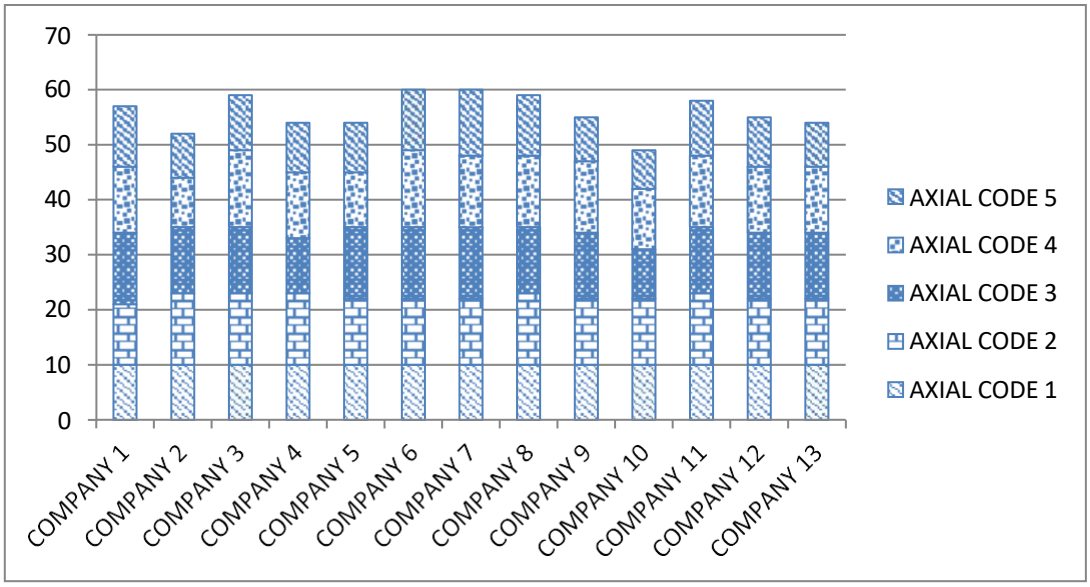

Figure 2: Cumulative indirect disclosure per company

The information in figure 2 was mainly done to identify how many companies provide sufficient in their annual/integrated reports in favour of the CE logic without explicitly wanting to provide CED. From the data in figure 2, it is clear that most companies provide sufficient CED despite there being no mandatory laws or framework for such disclosures. The only exception was company 10, which did not provide a sustainability or supplementary report so alternative annual publications for their 2017 financial year were used.

The high level of disclosure indicated in axial 2-4 of circular economy information was made possible by sustainability and integrated reporting frameworks. This emphasises the point that integrated and sustainability reports prepared in accordance with global reporting frameworks are an important tool to report on circular economy information. The study therefore finds that the guidelines of GRI standards and IIRC framework motivates for the disclosure of CE information and that reporting strategies are driven by the need to reflect compliance with global reporting framework. It is encouraging to note from the analysis that IFRS, sustainability and integrated reporting principles enables for reporting on CE related information. This reinforces prior findings that IIRC and IFRS principles are an important tool that can be used by companies to disclosure CE related information focused on environmental and social information (Kunc *et al*., 2020). The findings further supports the work by Barnabe and Nazir (2020) and Velte

ISBN NUMBER: 978-0-620-99843-7

and Stawinoga (2017) who suggested that integrated reporting is a principle based approach which is similar to reporting practices required for CE related information. The findings conclude global reporting frameworks are an important tool for communicating CE information.

CONCLUSION AND FUTURE RESEARCH

The research was conducted to identify whether JSE listed mining companies in South Africa incorporate CE information in their disclosures found in integrated and sustainability reports. The study makes findings that that the disclosures provided by companies does provide evidence to support a CE logic, this is encouraging given that in South Africa there is no legislative requirements for disclosure of CE related information. The study however notes that some of the disclosure is too generic, the study does not attempt to give findings on the quality of the disclosure but identifies this as an area of improvement and areas for future research.

The analysis of integrated and sustainability reports paints a picture that integrated reports are being used as a tool to disclose CE information. It is evident that there is very limited direct reference to CE in the reports. This finding of the study is consistent with those noted in prior literature which concluded that in countries were disclosure of CE information is not required by law very limited direct CE related information is disclosed. This finding does not suggest that circular economy is not being practiced by top 100 JSE listed mining companies however notes the lack of direct circular economy reporting strategies by these companies.

This study was merely a tick-box exercise to identify whether the disclosure was present, there is still more research needed to be done with regards to the quality of the CE related information disclosures, there is a need for studies to investigate this further (Janik *et al*., 2020). The study finds that integrated and sustainability reporting principles are important for enabling CE information to be communicated to stakeholder, this is in line with what has been suggested by other studies that an interplay between CE and IR has a potential of generating benefits for organizations (Chams & García-Bland, 2019; Dey *et al*., 2020; Kunc *et al*., 2020; Miras-Rodriguez, Martnez-Martinez & Escobar-Perez, 2019). Integrated reporting employs a key

ISBN NUMBER: 978-0-620-99843-7

principle of interconnectedness of the information which still needs to be explored in relation to CE related information in future studies. Further, more research is needed in other sectors to determine the extent of CED provided. Lastly, this study finds that King IV principles enable for CE information that can be communicated to users in an integrated report. This study has used a few principles from King IV, research is needed to identify whether complying completely with King IV principles leads to a better circular economy strategy and disclosure.

The study also presents that South African mining companies must embrace IFRS, GRI and IIRC frameworks as they enable for integration of CE related information in reported information and supports the environmental and social reporting agenda. Future studies are needed to analyse circular economy disclosure in other sectors and possible compare the findings between sectors to get a sense of CE reporting across sectors.

This study is not without limitations even though it has provided some insight into disclosure practices that have elements of CE information, the study only focused on the top 100 JSE listed mining companies. The results obtained from this study cannot be used to infer to CE related disclosure of other industries or sectors provide the same or sufficient disclosures in support of the CE. And cannot be generalise to all mining companies. Lastly, the inherent limitation of the CE is that it ignores the social dimension (Murray *et al*., 2015), so this means that it cannot be used to look at things in the complete scope of triple-bottom-line reporting (Geissdoerfer *et al*., 2017b). The disclosure checklist used in the study was derived with reference to multiple sources being the GRI, King IV, IFRS and prior literature. This approach was deemed appropriate due to the lack of standardized glossary disclosure of CE related information, even though it has a potential for researcher bias (Korhonen *et al*., 2018).

The implication of the study for policymakers highlights the need to encourage compliance with global reporting frameworks as they are an important tool for responding to stakeholder information needs for circular economy information. The study makes a finding that when global reporting frameworks are complied with, that

ISBN NUMBER: 978-0-620-99843-7

compensate for lack of direct CE disclosure. Practitioners must also be encouraged to incorporate more direct CE reporting strategies.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Effect of Board Composition on Capital Structure: Evidence from South Africa

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ABSTRACT

South African companies are pressured to create value for shareholders and promote diversity. The diversity of boards may provide an opportunity to create value by influencing the capital structure decisions, affecting financial value creation. This study aims to examine the effect of board composition on an entity's capital structure in a South African context. This study uses data from entities listed on the Johannesburg Stock Exchange (JSE). The data is from the entity's published financial statements and reports on 30 April 2018. Multiple linear regression was used to determine the impact of board size, director independence, director gender, director race and the financial education of the chairperson on capital structure. This study investigated the impact of board composition on capital structure in South African entities. It finds that board composition has important implications for capital structure decisions. Specifically, board size and director independence are significant determinants of capital structure in South Africa. Size and independence are both found to be negatively related to entity leverage. Further, the proportion of female and black directors positively relates to debt levels. This study also finds a negative relationship between the Chair's financial education and company leverage. Additionally, this study

includes variables to examine the impact of the chairperson's financial education and the board members' race on capital structure.

KEYWORDS

Board composition; board size; capital structure; gender diversity; independent directors; racial diversity

INTRODUCTION

For an entity to remain relevant in an increasingly demanding environment, directors and shareholders cannot ignore diversity's important role in governance (Beji *et al*., 2021). As boards continue to evolve, stakeholders must understand the impact these changes in the composition will have on entity value (Fernández-Temprano & Tejerina-Gaite, 2020) in a South African context.

The study of capital structure has undergone extensive development since the seminal theories first proposed by Modigliani and Miller (1958). Capital structure is a mix of debt and equity in a company's financing. The original theory postulated that, under simplifying assumptions, the choice between debt and equity did not matter. However, there has since been empirical research to recognise the importance of capital structure to an entity's value and performance (Muhammad, Shah & Islam, 2014; Titman & Wessels, 1988).

As capital structure has been determined to be important to long-term entity value, much research has been conducted to understand the optimal capital structure and the factors relevant to determining an entity's capital structure (Ramli, Latan & Solovida, 2019). Understanding the drivers of capital structure is important for management and capital providers, given its impact on entity valuation. Literature indicates that many significant determinants of capital structure exist, including board composition characteristics. However, there has been limited research into the determinants of capital structure in a South African context.

ISBN NUMBER: 978-0-620-99843-7

The importance of board composition to capital structure and entity value has been identified in international studies (Ramli *et al*., 2019), as introduced above. South African companies are also under pressure to increase diversity on their boards; therefore, this study aims to identify if a relationship exists between board composition and capital structure within a South African context. If this relationship exists, it provides insight into mechanisms that can be used to satisfy both pressures experienced by companies. This will be done by using multiple regression analysis to investigate the significance of board composition characteristics of South African entities listed on the Johannesburg Stock Exchange (JSE) on their capital structure decisions. Certain board composition characteristics of particular significance within the South African context, such as race and gender diversity, have been included (Fakoya & Nakeng, 2019).

In line with international research (Esparza, Briano-Turrent & Garcia-Estrada, 2018), the results indicate that board size and board independence are significant determinants of the capital structure of South African entities and are negatively related to debt levels. The other composition factors are not important in determining capital structure. These results indicate that the board's structure is more significant than the characteristics of the individuals' filling positions in understanding the capital structure decision of South African entities.

The contribution of this study to the existing literature is two-fold. It examines the relationship between board composition and capital structure within a South African context. Secondly, it includes variables to measure the potential relationship between race and the financial education of the chairperson.

The remainder of this paper is structured as follows: the second section previews existing literature and highlights the significance of the capital structure decision. The next section explains the methodology and data used for the study. Empirical results are then presented and discussed, with recommendations and concluding remarks.

ISBN NUMBER: 978-0-620-99843-7

LITERATURE REVIEW

This literature review provides an overview of capital structure theories and factors influencing an entity's capital structure decision. The relevance of the research question is highlighted based on the empirical link between capital structure and entity performance.

Capital structure theory

Capital structure refers to the ratio of debt and equity used by an entity to finance its investments and operations. The financing decision is vital for the financial welfare of the entity, and false decisions may eventually lead to financial distress and bankruptcy (Luigi & Sorin, 2009). An entity's capital structure plays a significant role in determining entity value to its shareholders. As such, an entity aims to set its capital structure optimally to maximise its value (Viviani, 2008).

A lower cost of capital results in a theoretically higher entity value based on an income valuation approach, *ceterus paribus* (Luigi & Sorin, 2009). Alipour's (2015) view corroborates that a lower cost of capital allows an entity to accept more investment opportunities and generate a greater return. The optimal capital structure considers the benefits and risks of the two funding sources to ensure that the total cost of capital is minimised (Luigi & Sorin, 2009). Management can issue various debt and equity instruments in endless combinations. It is accepted that this decision forms part of management's responsibilities under the supervision of the board (Abor, 2005).

Capital structure theories

A capital structure theory refers to a systematic approach to financing business activities through a combination of equity and liabilities, the two general funding sources available to an entity (Luigi & Sorin, 2009). Despite a large amount of literature, no specific method is formalised for managers to determine an optimal capital structure (Alipour, 2015). Instead, various capital structure theories explain how a manager's rationale in the financing decision is influenced. A proposed theory will explain the factors driving each funding source's costs, risks, and benefits, ultimately impacting the manager's choice of how much each source to use.

ISBN NUMBER: 978-0-620-99843-7

Despite the large research volume, two dominant schools of thought exist; trade-off theory and pecking order theory. These theories provide different reasons to explain management's behaviour related to the financing decision (Alves, Barbosa & Morais, 2015).

Trade-off theory

The trade-off theorem has been developed based on the thesis first proposed by Modigliani and Miller (1958) and supplemented by further research from Jensen and Meckling (1976, 1986) and Myers (1977). Modigliani and Miller (1958) first proposed that the capital structure will have no relevance on entity value under a set of restrictive assumptions. These restrictive assumptions included perfect capital markets, homogenous expectations, no taxes, and no transaction costs (Modigliani & Miller, 1958). Despite having no real-world gravitas, the theory provided a framework for analysing capital structure. Modigliani and Miller (1959,1963) revised their initial position to incorporate the impact of taxes and financial distress costs associated with debt.

The static trade-off theory formalised by Myers (1983) suggests that entities will target an optimal mix of debt and equity, maximising the benefit over debt costs. According to this theory, an optimal capital structure exists and will balance the marginal cost and marginal benefit associated with debt. The benefit of debt is the interest tax shield because interest payments to debtholders are tax-deductible (Modigliani & Miller, 1958). Tax deductibility lowers the effective cost of debt and encourages entities to use more debt funding.

The costs of debt are described in the literature as financial distress costs. These costs have been defined as direct and indirect bankruptcy costs (Kraus & Litzenberger, 1973) and agency costs (Jensen & Meckling, 1976). Financial distress costs are present when the probability of defaulting on the debt is greater than zero. Given the inherent risk in debt, such a probability will always be positive. The bankruptcy probability increases with the debt level as the entity is required to cover higher interest costs and is subjected to higher financial leverage (Jensen & Meckling, 1976). Beyond

ISBN NUMBER: 978-0-620-99843-7

these bankruptcy costs, entities must also consider the agency costs arising from conflict of interests between equity and debt holders due to asymmetrical information (Jensen & Meckling, 1976). Ryen *et al*. (1997) explain that manager-shareholder conflict arises when managers forego shareholder value through leveraging based on an unwillingness to increase entity financial risk to protect their employment. Additionally, due to potential risk shifting and asset substitution problems, debt providers incorporate covenants, monitoring devices, and risk premiums, increasing the cost of debt funding and creating potential underinvestment problems for the entity (Alves *et al*., 2015).

Trade-off theory argues that an entity has a single optimal capital structure that can be achieved by balancing debt costs and benefits. Importantly, it implies that when capital structure deviates from the target, entities will adjust their financing behaviour in a way that brings the ratio back to the optimal level.

Pecking Order theory

The concept of an optimal capital structure is also expressed by Myers (1983) in the pecking order theory. The theory explains capital structure through the impact of information asymmetry and adverse selection costs on management behaviour in the financing decision. In contrast to trade-off theory, pecking order purports that capital structure is derived based on a hierarchy of funding sources due to inherent information asymmetry between shareholders, debt providers and managers (Myers, 1983). The existence of information asymmetry between the entity and external finance providers, coupled with adverse selection costs, causes the relative cost of funding sources to vary. Therefore, because of the information asymmetry, if an entity requires funding for a new investment opportunity, entities prefer to use retained earnings over debt, short-term debt over long-term debt, and long-term debt over equity (Myers, 1977).

The theory builds on the premise of asymmetric information problems between internal managers and external investors, coupled with the signalling effect proposed by Jensen and Meckling (1976). Managers are entity insiders; they have more information regarding their performance and prospects than external funding providers. External

ISBN NUMBER: 978-0-620-99843-7

parties are thus forced to infer the entity's value based on management's behaviour and action. According to signalling theory, equity investors rationally interpret a new equity issue as indicating negative performance and financial distress and demand a higher discount on share prices to compensate for an increased perceived risk.

Debt providers are equally subject to information asymmetry. However, they demand a lower return than equity providers, given that debtholders have a preferential claim, and the agreement can be secured, thus reducing risk on a relative basis. Myers (1983) argued that the adverse selection cost premium is lower for less risky securities. In addition, the lower the extent of information asymmetry, the riskier securities the entity will use in its capital structure.

Although neither the Trade-Off Theory nor Pecking Order Theory can explain all the stylised facts, the pecking order theory has shown to hold empirically with the literature. It indicates that managers frequently act per the predictions of the pecking order theory, despite holding some form of target leverage ratio (Alves *et al*., 2015; Lemmon & Zender, 2010).

Impact of capital structure on entity performance

Modigliani and Miller (1958) purported that the capital structure would be irrelevant to an entity's value in a perfect world with no expectations and perfect markets. However, the world is imperfect, and capital structure is an important factor in an entity's performance and value. Research completed to investigate the significance of the proportion of debt to equity funding on an entity's performance and value (Mashavave & Tsaurai, 2015) has varying conclusions. Research has concluded a significant relationship between capital structure and entity performance. However, there is no consensus on whether it is positive or negative.

Empirical studies completed in developing and developed countries (Garanina & Murayev, 2021; Garcia & Herrero, 2021) analyse the impact of capital structure on entity performance from an accounting and market performance perspective. Research conducted on listed entities in India, Ghana, Hong Kong and the USA found

ISBN NUMBER: 978-0-620-99843-7

significant positive relationships between profitability measured by a Return on Equity (ROE) metric and debt levels (Abor, 2005; Chisti, Ali & Sangmi, 2013; Sethi & Tiwari, 2016). Wiell (2008) examined the relationship between leverage and financial performance measured by Return on Assets (ROA) and concluded a significant positive relationship exists (Weill, 2008). Results indicate that less risky and cheaper short-term debt leads to higher entity profits due to relatively lower associated interest.

In addition, empirical literature shows significant positive relationships between the debt level and entity share price as a proxy for market value on listed exchanges in Bangladesh, India and Nigeria (Aggarwal & Padhan, 2017; Chowdhury & Chowdhury, 2010; Mohohlo, 2013). Complimentary studies were concluded using Tobin's Q as a proxy for market value. Salim and Yadav (2012) found a significant positive relationship between entity debt levels and market value measured by Tobin's Q on the Bursa Malaysia Stock Exchange. These findings indicate that higher debt levels result in higher entity valuation, supporting the trade-off theory.

However, research has also concluded a significant negative relationship exists between an entity's capital structure and accounting-based performance. Kanwal (2017) and Muhammad *et al*.'s (2014) research on non-financial listed Pakistani entities indicate a negative relationship between debt, measured by debt divided by equity ratio, and profitability, measured by ROA. Additionally, research conducted by Nassar (2016) on listed entities from a range of industries on the Istanbul Stock Exchange (ISE) concluded a negative relationship exists between the total debt-to-assets ratio and financial performance as defined by ROA, EPS and ROE (Nassar, 2016). Wiell (2008) concluded that a negative relationship exists between financial leverage and entity profitability measured by the ROE of listed entities in France, Germany, Norway and Belgium (Weill, 2008). These results imply that a high debt level harms an entity's profitability.

In contrast, several researchers have identified no clear statistically significant relationship between capital structure and performance through their studies in Egypt, Malaysia, Portugal, and Spain. These are found in both emerging and developed markets. Researchers have concluded through regression analysis of the capital

ISBN NUMBER: 978-0-620-99843-7

structure and profit metrics such as ROE and ROA, that no significant relationship exists in listed entities in Portugal (Weill, 2008), Egypt (El-Sayed Ebaid, 2009) and Malaysia (San & Heng, 2011).

Research methodology applied in these findings for and against a significant relationship utilises a similar statistical regression analysis as Esparza *et al*. (2018) and Garcia and Herrero (2021). The disparity in findings may be because of the differences in sample sets analysed, based on different geographical locations or industries exposed to different external factors and determinants of capital structure.

Limited empirical research has been conducted on entities listed on the JSE in South Africa. However, the limited evidence from the JSE is mixed. Abata, Migiro and Akande (2017) and Marandu (2016) found that profitability measured by ROA positively relates to long-term debt when analysing non-financial and banking entities. Rayan (2008) found a significant negative relationship between Earnings Per Share as a measure of accounting performance and leverage. In contrast, research conducted by Mashaveve (2015) and Mohohlo (2013) indicates no significant relationship can be drawn based on the research outcomes into the link between capital structure and performance on the JSE, given the results are haphazard with no consistency.

Determinants of capital structure

The capital structure decision is influenced by many macroeconomic, industry-specific or entity-specific factors. Over the last century, capital structure theories have been developed and modified on a theoretical basis, attempting to explain the variation in debt ratios across entities. However, empirical studies to support the theories developed have lagged. It appears evident that the primary methodology for empirical testing is based on a multivariate regression with a form of a leverage ratio as the dependent variable, with a model generated detailing the explanatory power of the selected factors.

ISBN NUMBER: 978-0-620-99843-7

Research into the capital structure of entities in emerging markets has been particularly lacking and explained by Sehti and Tiwari (2016) to be attributable to the lack of well-developed financial markets.

From a theoretical and empirical perspective, a consensus exists in the literature that the following factors will impact an entity's debt-equity choice of funding: profitability, size, tangibility, and industry.

Profitability

Profitable entities face lower funding costs, particularly with debt finance sources based on lower expected costs of financial distress and higher relative benefit from interest tax shields given the high profits. Thus, trade-off theory predicts that more profitable entities utilise more debt given the high-interest tax shield benefit and lower distress costs. In corroboration, agency theory predicts higher debt levels associated with profitability as shareholders attempt to restrict the managers' use of the increased free cash flow (Jensen & Meckling, 1976). On the contrary, the pecking order theory predicts that holding investment and dividends constant, an increase in profitability will decrease leverage as managers prefer to utilise internally generated funds (Myers, 1983).

Size

According to trade-off theory, larger, more diversified entities are inherently exposed to lower default risk due to more stable earnings and, as such, have lower financial distress costs allowing them to tolerate higher levels of debt (Alipour, 2015). Additionally, more established entities with better credit histories in debt markets will face lower agency-related costs and lower interest yields required by debtholders. Accordingly, trade-off theory predicts that larger, more mature entities will have relatively more debt. On the other hand, the pecking order theory implies that more established entities will have lower debt levels allowing them to raise larger amounts of funding. They have greater access to equity markets and relatively cheaper issuance costs, thus allowing them to use equity funding over debt funding.

ISBN NUMBER: 978-0-620-99843-7

Tangibility

A higher proportion of tangible assets, such as property and other fixed assets, is easier for outsiders to identify and value relative to intangible assets, such as goodwill, thus lowering the information asymmetry. Pecking order theory predicts that an entity with a high proportion of tangible assets will have lower leverage due to lower equity issuance costs. In contradiction, the trade-off theory predicts greater leverage associated with the higher tangibility of assets. The tangible asset base is seen by creditors and lenders as effective collateral, thus lowering the financial distress costs and making debt more appealing for entities (Alipour, 2015).

Industry

Entities in the same industry will face similar forces which influence their financing decision, such as product variety, level and nature of competition and growth prospects, as entities within the same industry may face homogeneity in the type of assets, technology and operational risks (Grant & Yeo, 2018). Certain industries face more regulation than others, with trade-off theory suggesting that more regulated industries should have higher leverage to ensure more stable cash flows and lower financial distress costs (Frank & Goyal, 2009). Furthermore, Hovakimian, Opler and Titman's (2001) research suggest that managers actively readjust their entity's capital structure to align with average industry leverage. It can be inferred that the mean industry leverage may determine an individual entity's capital structure.

Capital structure and board composition on the Johannesburg Stock Exchange

Despite the large literature on capital structure determinants, limited empirical research exists into the capital structure and determinants thereof for entities listed on the JSE. Given the highly concentrated nature of the JSE, most research only covers a sample of fewer than 200 entities, given this sample size encompasses roughly 99% of the JSE value.

Capital structure

An important factor impacting the debt level used by South African entities is the relatively underdeveloped bond market in South Africa. This is coupled with high

ISBN NUMBER: 978-0-620-99843-7

nominal interest rates set by the South African Reserve Bank (SARB), considering political conditions and sovereign bond credit ratings (Marandu & Sibindi, 2016). The Mohohlo (2013) analysis concluded that South African entities utilise more long-term debt than short-term debt. Mohohlo (2013) further states that various industries are exposed to different statistically significant determinants which influence the entity's capital structure, based on an analysis of health care, technology, consumer goods, consumer services, basic materials, and industrial industry categories. The leverage ratios also differed among industries, with the health care industry having the highest and the technology industry having the lowest (Mohohlo, 2013).

Ratshikuni (2009) researched the capital structures of 97 JSE-listed companies from 1987 to 2009 and concluded that South African entities have relatively low leverage in their capital structure relative to other emerging and developed markets. Ratshikuni (2009) performed hindsight modelling to test the amount of debt capacity and speed of adjusting capital structure found in the sample. Results indicate that most industries could have utilised more debt significantly in their capital structure and, by doing so, increased shareholder value over the 22 years (Ratshikuni, 2009).

Literature specific to a JSE-listed sample of entities indicates similar results in the larger international body of literature related to the significant determinants of debt levels. Mohohlo (2013) concluded that South African entities determine their capital structures according to the pecking order theory. The results indicate that profitability, entity size, and asset tangibility all have a statistically significant relationship to leverage, based on a sample of 82 JSE non-financial listed entities across a range of industries. These findings are corroborated by research from Gwatidzo and Ojah (2009), who found the same determinants significant in five African countries. Furthermore, Ramjee and Gwatidzo (2012) concluded that a positive relationship exists between asset tangibility, growth, size and leverage, while a negative relationship exists between profitability, tax and leverage based on a sample of 178 listed entities from 1998 to 2008.

ISBN NUMBER: 978-0-620-99843-7

Board composition

JSE-listed entities are governed by the *Companies Act no.71 of 2008* (the Act) and the requirements of *King IV Report on Corporate Governance for South Africa* (King IV) under the JSE listing requirements. The Act requires a public company to have at least three directors, of which the shareholders elect at least 50%. It also requires the directors always to exercise their duties in the company's best interest. King IV requires that the board be composed of an appropriate balance of knowledge, skills, experience, diversity and independence to ensure objective and effective achievement of its roles. King IV further requires diversity in its membership across the fields of knowledge, skills, experience, age, race and culture (Institute of Directors South Africa, 2016)

Empirical research by Nyirenda (2010) on JSE-listed entities identified the average composition of a 'typical' board for the sample of entities in terms of age, gender, race, tenure, and independence. The results of the investigation of 100 JSE-listed entities indicate the average director tenure to be 9.6 years, the average board size to be 9.4 members, the average age to be 53, with 26% of directors being of colour, and 10% of directors being female (Nyirenda, 2010).

Conclusion

There has been extensive research into the capital structure, highlighting the importance of the decision to an entity's value and financial performance. Given this importance, much research has been done to understand the determinants and drivers of an entity's capital structure. Board composition characteristics are significant factors impacting capital structure from an international perspective among the many determinants.

Despite the extensive research, there is little published evidence of board composition's impact on leverage in a South African context. Given that South African entities are under pressure to increase diversity among board members (Beji *et al*.,

ISBN NUMBER: 978-0-620-99843-7

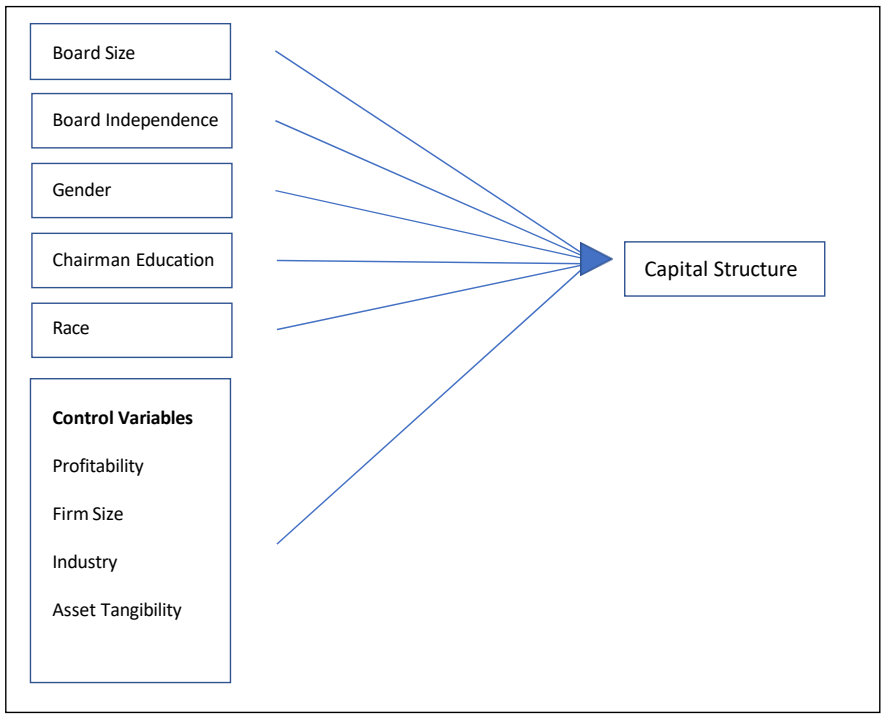
2021), more research is required to understand the impact of board composition changes on capital structure.

METHODOLOGY

This study aims to determine the relationship of the following characteristics with the capital structure of South African entities. The factors examined are board size, board gender diversity, board independence, board racial diversity and financial education of the chairperson. These factors are used in similar studies (Esparza *et al*., 2018; Garcia & Herrero, 2021).

Research model and hypotheses

The research methodology used in this paper is based on a statistical multiple factor regression model. This research uses a standard multiple regression based on the enter method, which includes all variables simultaneously. The form of the model, as presented in Figure 1, is:



$$Leverage \quad \alpha + \beta_1 Size + \beta_2 Indep + \beta_3 Edu + \beta_4 Gender + \beta_5 Race + \beta Control + \varepsilon$$

Figure 1: Graphical depiction of model

ISBN NUMBER: 978-0-620-99843-7

Diversity of board

Diverse boards benefit from various views and experiences (Nielsen & Huse, 2010). In this study, board diversity considers the race and gender of board members and the education of the chairperson.

Gender diversity is an important characteristic of a board, as many studies indicate it impacts an entity's board efficiency. Literature reveals that investigations into the characteristics of women as directors include women directors being more likely to take active roles, debate and ask questions than male counterparts, attend more meetings and suggest that female directors offer a fresh perspective to complex and technical problems (Ferreira, 2010; Nekhili & Gatfaoui, 2017). The presence of women on boards was found to have a moderating effect in developing countries (Zaid, Wang, Abuhijleh, Issa, Saleh & Ali, 2020). Additionally, evidence suggests that boards with more women have increased levels of public disclosure and better management oversight (Alves *et al*., 2015). The pecking order theory would predict increased leverage given the lower information asymmetry because of the characteristics.

Based on the above literature, this research paper hypothesises that:

H_1 – Leverage is positively related to the diversity of the board.

Size of board

A larger board may yield additional benefits given the broader base of resources available to the entity and a larger network to the external environment (Salancik & Pfeffer, 1980). It is suggested that the optimal number of directors is 8 or 9, and any further size increases detract from the benefits given the inability to make decisions and voice all opinions within the meeting times (Jensen & Meckling, 1976).

The impact of board size on information asymmetry is ambiguous, and empirical research has presented contrarian findings on the relationship between size and leverage. On the one hand, researchers argue that large boards are less efficient in monitoring management due to decision-making, coordination, communicating, and accountability being more onerous. On the other hand, researchers argue that larger boards have a greater propensity for voluntary disclosure and ensuring the integrity of

ISBN NUMBER: 978-0-620-99843-7

financial information. The increased number improves monitoring ability, thus reducing information asymmetry. In summation, empirical results have been found to support both a positive (Florinita, 2013), negative (Abobakr, 2016), and insignificant (Alves *et al*., 2015; Tarus & Ayabei, 2016; Wen, Rwegasira & Bilderbeek, 2002) relationship between board size and leverage of entities.

Based on the above literature, this research paper hypothesises that:

H_2 – Leverage is negatively related to the size of the board

Director independence

Board independence is a significant characteristic of board composition, with strong support from literature to indicate the relative proportion of independent to non-independent directors impacts the board's effectiveness. Baysinger and Butler (1985) define independent directors as those not directly employed and have no economic or psychological dependence on the entity. In theory, independent directors are external and reduce conflicts of interest and agency costs (Muchemwa & Callaghan, 2013). According to Alves *et al*. (2015), several research studies have found that increased independence correlates to improved monitoring of information disclosure and reduces information asymmetry.

Although some studies have found no relationship between director independence and capital structure (Vijayakumaran & Vijayakumaran, 2019), empirical studies conducted by Florinita (2013), Alves *et al*. (2015) and Tarus and Ayabei (2016) concluded a positive relationship between independence and leverage existed in their research of entities in developed markets. These findings are theoretically supported as the lower information asymmetry will incentivise managers to take on risky funding sources such as long-term debt.

Based on the above literature, this research paper hypothesises that:

H_3 – Leverage is positively related to the proportion of independence on board.

Statistical analysis

The results of the regression output were analysed to identify the direction of the relationship of each independent variable to leverage based on the beta coefficients. A *t-test* and related *p-value* were used to determine the statistical significance of each

ISBN NUMBER: 978-0-620-99843-7

predictive variable within the model. This is similar to the method employed by Esparza *et al*. (2018). Furthermore, the *F-test* was used to assess whether the independent variables collectively predicted the leverage. The multiple correlation coefficient of determination (*R-squared) is* used to determine how the independent variables can explain much variance in the leverage variable. The assumptions for a multiple regression were all tested and met.

Research data

The data used in this study was derived from publicly listed entities on the Johannesburg Stock Exchange (JSE) extracted from the Bloomberg database. The total number of entities listed on the JSE main board as of 2017 is 432, across various sectors, including industrials, resources & financials. According to market capitalisation, this study only considers the largest 100 entities as of 30 April 2018. The JSE is a highly concentrated market, and a sample of the top 100 (approximately 99% of total market capitalisation) is appropriate to conclude the entire population of listed entities.

For this study, the sample set excludes entities that Bloomberg classifies to be in the financial industry, including banks, financial services, and property companies. This approach is in line with similar studies conducted by Alves *et al*. (2015); Muchemwa and Callaghan (2013), Tarus and Ayabei (2016) and Yoshikawa and Phan (2005), as their capital structure is different from that of non-financial entities, given that their capital structure, sources and allocation of funds are dictated by regulations including mainly the capital adequacy ratio and reserve requirement, meaning directors have less control over the capital structure decision. This exclusion intends to generate a sample of entities where the board can decide on the capital structure without regulatory influence.

The sample-set excludes entities with a primary listing on an exchange outside South Africa. This exclusion aims to generate a sample set of exclusively South African-based and listed entities to isolate the sample to entities that are only subjected to

ISBN NUMBER: 978-0-620-99843-7

South African governance guidelines and legislation and exclude entities that are compliant with and influenced by foreign externalities and legislation.

The final sample included 61 of the top 100 listed JSE companies by market capitalisation. The companies included are shown in Appendix 1.

Measurement of variables

The data points for the dependent, independent and control variables were generated from the Bloomberg database and supplemented by secondary data, including the Integrated Report and Annual Financial Statements issued on the individual entity's websites. The data points collected for each variable were based on the most recent published annual financial year-end reports, including Integrated Reports, of the sample of companies up until April 2018, when the data was collected.

Dependent variables

The dependent variable used as a proxy for capital structure is a financial leverage ratio as measured by the percentage of total debt to total capital structure, as Abor and Biekpe (2015) used. The ratio is based solely on book values as market values of total debt are not readily available for all entities in the sample, given the use of non-traded debt due to underdeveloped South African debt markets. Using the market value of debt would significantly reduce the sample size. Additionally, in line with the research from Graham and Harvey (2001), it is held that the financing decision is unaffected by the market value of equity as the market value is representative of the value post issuing the funding.

$$Leverage \quad \frac{Total\ Debt\ (Book\ Value)}{Total\ Equity\ (Book\ value) + Total\ Debt\ (Book\ Value)}$$

Independent variables

Size

Board size is measured by the total number of director positions on the board, as presented by the integrated report and reflected on the Bloomberg database. This definition of board size is consistent with other international studies (Abor & Biekpe, 2015; Tarus & Ayabei, 2016; Yoshikawa & Phan, 2005)

ISBN NUMBER: 978-0-620-99843-7

Director Independence

Director independence is measured by the proportion of directors out of the total board size, which is classified as independent by the integrated report and reflected on the Bloomberg database. King IV recommends companies disclose the independence of all directors, and this research relies on the assertions presented by the companies directly in their reports (King Committee on Corporate Governance, 2016).

Chairperson financial education

The financial education of the board's chairperson is measured by a dummy variable assigned 1 for financial education and 0 for non-financial education. For this research, financial education was defined by a commerce undergraduate or postgraduate degree or accredited commerce qualification. The data for this variable was determined based on a visual analysis of the integrated report's governance disclosure sections.

Gender

Gender is measured by the proportion of female directors as a percentage of the total number of directors. The data for this variable is extracted from the Bloomberg database, which is based on the classification of the director's gender as presented in the entity's annual integrated report.

Race

Race is measured by the proportion of black directors as a percentage of the total number of directors. A black person is defined by the Employment Equity Act [No. 55 of 1998] to be any black, coloured or Indian person. This research report measures the race of directors based on the classification as presented in each entity's annual governance disclosure reports and relies on the assertions presented by the companies.

Control variables

The literature indicates that many factors influence and explain an entity's capital structure decision. For this research, the model includes a set of control variables to

ISBN NUMBER: 978-0-620-99843-7

isolate the independent variables' impact on capital structure. The control variables included align with the research conducted by Tarus and Ayabei (2016), who identify the following factors as significant determinants of capital structure; profitability, size, the tangibility of assets, and industry.

Profitability

Profitability is measured as the ratio of profit before interest, tax, and depreciation to total assets, in line with Sethi and Tinwari's (2016) research. This metric isolates profits generated from operations and presents the entity's ability to generate profits using its asset base.

Size of entity

Entity size will be measured by the natural logarithm of the entity's total assets. This is similar to the measurement used by Sethi and Tinwari (2016), Suto (2003) and Alipour (2015) in their research into the determinants of capital structure.

Tangibility

Asset tangibility is measured by the ratio of net fixed assets to total assets. This is in line with research completed by Titman and Wessels (1998).

Industry

The industry is measured by being assigned a dummy variable of 1 for manufacturing and 0 for non-manufacturing as per the study conducted by Tarus and Ayabei (2016), in line with Plambeck and Weber (2010). The Bloomberg database categorises entities in the Global Industry Classification Standards (GICS) developed by Standards & Poor.

Limitations

Whilst the methodology is widely used in literature, the data used in this research is subject to limitations. The data collected for the independent variable is based on each entity's classification of director independence, which may be subjected to bias and discrepancies between the different entity's classification requirements. However, the

ISBN NUMBER: 978-0-620-99843-7

data can be said to have been consistently collected by consistently using the classification provided by the companies themselves.

RESULTS

Descriptive statistics

Tables 1 and 2 present the descriptive statistics for the study. The results are split between the dependent and independent variables and the industry classification of the 61 entities in the sample.

Table 1: Descriptive statistics

Statistic	Leverage	Director Independence	Size	% Women on Board	% Black on Board	Financial Education of Chair
Mean	32.51%	60%	11.77	22%	43%	0.61
Mode	4.00%	50%	12	20%	50%	1.00
Std Deviation	17.78%	12.83%	2.51	9.83%	15.88%	0.49
Minimum	2%	33%	8	8%	9%	0.00
Maximum	68%	86%	20	45%	80%	1.00
N	61	61	61	61	61	61

ISBN NUMBER: 978-0-620-99843-7

Table 2: Industry classification

Sector	Number of Entities
Energy	1
Materials	17
Industrials	8
Consumer Discretionary	12
Consumer Staples	15
Health Care	3
Insurance	2
Telecommunications	3

The results indicate that South African entities have low use of debt within their capital structure, as indicated by a mean leverage ratio of 32.51%, with a minimum of 2% and a maximum of 68%. These findings are supported by prior South African literature from Harrison (2003) and Ratshikuni (2009), which indicated South African companies utilise substantially lower debt than entities in developed markets such as the USA. The conservative use of debt can be attributed to the relatively higher interest costs experienced in South Africa over the last decade and the relatively underdeveloped debt market in the country.

The board composition variables are in line with previous research by Nyirenda (2010) on South African companies and are a direct result of company adherence to King code principles. Table 1 shows that the average board size consists of 11.77 members, with most entities having 12 director positions. These results indicate an increase from the average board size of 9.404 members reported by Nyirenda in 2010 based on a sample of 100 entities. The increase may be attributable to entities increasing directorship positions to improve monitoring and connection to external resources considering tightening South African regulations and weakened trading conditions in South Africa over the past decade (Sibeko, 2021). Furthermore, the mean proportion of independence of the board is to be 60%, with the mode at 50%, in line with principle seven (King Committee on Corporate Governance, 2016) to have a majority of members non-executive as independent directors.

South African listed entities face regulatory pressure from B-BBEE mechanisms and King code requirements to implement a diverse board in terms of race and age

ISBN NUMBER: 978-0-620-99843-7

(Empowerdex, 2011). Table 1 indicates the mean percentage of black directors to be 43%, with a maximum of 80% and a minimum of 9%, while the mean percentage of woman directors is 22%, with a maximum of 45% and a minimum of 8%; signifying that entities are more balanced in terms of race than gender. The review of secondary data in the entity's integrated reports indicates that boards aim to achieve more balanced compositions in the future.

Empirical results

Regression analysis results presented in Table 3 denote that the specified model can explain 22.72% of the variation in entities leverage. While this is a statistically weakly fitted model (as illustrated by the values below), the model's results remain valid in identifying the direction of the relationship between variables. The F-statistic and related significance value indicate the model to be significant and valid at an 87.8% confidence level.

ISBN NUMBER: 978-0-620-99843-7

Table 3: Regression model coefficient results

	Coefficients (β)	*Standard Error*	*t Stat*	*P-value*
Constant (α)	0.2107	0.2074	1.0156	0.3146
Independence	-0.2402	0.1518	-1.5823	0.1198
Board Size	-0.0195	0.0104	-1.8724	0.0669
% Women Board Members	0.2635	0.2713	0.9715	0.3359
% Black Board Members	0.0875	0.1664	0.5259	0.6013
Financial Education of Chair	-0.0316	0.0464	-0.6810	0.4990
Profitability	0.2180	0.2558	0.8522	0.3981
Size	0.0472	0.0257	1.8391	0.0717
Tangibility	0.1418	0.1181	1.2014	0.2351
Industry	-0.1205	0.0525	-2.2951	0.0259

Regression Model Statistics	
Multiple R	0.4766
R Square	0.2272
Adjusted R Square	0.0908
Standard Error	0.1696
Observations	61

ANOVA

	df	*SS*	*MS*	*F-Statistic*	*Significance F*
Regression	9	0.4310	0.0479	1.6655	0.1220
Residual	51	1.4663	0.0288		
Total	60	1.8973			

ISBN NUMBER: 978-0-620-99843-7

Table 4: Pearson correlation coefficients

	Leverage	Independence	Board size	% Women board members	% Black board members	Financial education of Chair	Profitability	Size	Tangibility	Industry
Leverage	1.000									
Independence	-0.071	1.000								
Board size	-0.188	-0.033	1.000							
% Women board members	0.125	0.399*	-0.153	1.000						
% Black board members	0.100	0.155	0.217*	0.390	1.000					
Financial education of Chair	-0.019	-0.170	-0.007	-0.037	-0.078	1.000				
Profitability	0.133	-0.005	-0.174*	0.033	-0.059	-0.030	1.000			
Size	0.035	0.162	0.479	-0.100	0.159	0.028	-0.198	1.000		
Tangibility	0.018	0.269*	-0.014	0.042	0.258*	0.012	0.009	0.103	1.000	
Industry	-0.258	0.192**	0.010	-0.016	0.014	-.0216	-0.063	0.168**	0.436*	1.000
	Note: *:Significant at 5% level; **: Significant at 10% level for t-test									

ISBN NUMBER: 978-0-620-99843-7

Analysis of assumptions

The underlying assumptions of the multiple linear regression model were verified. It is determined that the underlying data meets the requisite assumptions for a valid regression model, thus allowing for inferences regarding the data. The assumptions of multiple regression – linearity, independence, homoscedasticity, absence of multicollinearity and normality of the data were assessed. Linearity, which assumes a straight-line relationship between independent and dependent variables, and homoscedasticity, which implies normal distribution about the regression line, were tested by examining scatter plots. Multicollinearity refers to correlation among the independent variables, resulting in increased standard error of coefficients and unreliable statistical significance. Multicollinearity was assessed using Variance Inflation Factors (VIF), with figures over five indicating multicollinearity (Corporate Finance Institute, 2022).

Interpretation of results

Below is an interpretation of the results of the regression analysis. Each variable that was shown to be statistically significant is discussed separately.

Director gender

The regression results presented in Table 3 show that the proportion of women directors on the board is positively related to leverage, albeit not statistically significant within the model (β = 0. 2635; p-value = 0.3359). This is corroborated by a positive Pearson correlation coefficient of 0.125, presented in Table 4.

The study indicates that an increased proportion of female directors increases the use of debt within the capital structure. This finding supports the hypothesis developed based on prior literature. The relationship is in line with the pecking order theory, given that a greater proportion of female directors reduces information asymmetry, lowering the cost of debt and encouraging increased use thereof (Garcia & Herrero, 2021). Two reasons may explain the lowered information asymmetry; firstly, the literature indicates women have increased levels of public disclosure and better management oversight (Garcia & Herrero, 2021); secondly, debt providers may perceive a more gender-diverse board to have increased monitoring efficiency and related financial control resulting in lower risk and required interest compensation (Garanina & Muravyev, 2021). This position supports previous findings by

ISBN NUMBER: 978-0-620-99843-7

Alves *et al*. (2014) in their international research across 33 countries and illustrates the same relationship holds in a South African context.

Director independence

Table 3 presents a statistically significant and negative relationship between the proportion of independent directors on the board and entity leverage (β = -0.242; p-value = 0.1192). This is further corroborated by a Pearson correlation coefficient of -0.071. These results align with Wen *et al*. (2002) and Esparza *et al*. (2018) on listed companies.

The results indicate that a greater proportion of independent directors results in less debt by the entity. According to pecking order theory, this relationship indicates that a greater proportion of independence leads to increased information asymmetry and higher costs of external funding sources, leading to more use of the equity in the form of retained earnings.

A few reasons may potentially explain this relationship. The increased information asymmetry and related costs of external financing sources could be explained by capital providers perceiving independent directors as knowledgeable and lacking industry or entity-specific experience to monitor and question management effectively, resulting in relatively worsened management. Additionally, it could be argued that independent directors may become over-involved in executive decisions, resulting in unproductive frictions within management. These factors could be perceived as increased risk and increase costs for the entity to obtain external funding.

Conversely, it is suggested that independent directors enhance the protection of shareholders' interests by improving the effectiveness of monitoring executives and decision-making (Bhagat & Black, 2000). The negative relationship found may thus potentially be explained by the more rigorous monitoring placed on executive management leading to the lower debt being utilised to reduce financial risk and performance pressures associated with large, fixed commitments to repay interest and capital regularly.

Board size

The results in Table 3 show that board size is negatively related to leverage and is a statistically significant determinant of leverage (β= -0.0195; p-value = 0.0669). Table 4

ISBN NUMBER: 978-0-620-99843-7

indicates the Pearson correlation coefficient to be -0.188. These results indicate that within a South African context, a larger number of directors on an entity's board results in a lower amount of debt.

This finding contradicts research completed by Wen *et al.* (2002), which postulated that the positive relationship results from lowered costs of external funding sources due to larger board sizes allowing for increased monitoring, coordination, and decision making. However, the findings of this study agree with the more recent findings of Abor (2015) and Tarus and Ayabei (2016).

This significant negative relationship may be explained by larger boards being more inefficient in decision making and monitoring in a South African context, given that South African culture, coupled with the diverse range of backgrounds, may facilitate more dispute amongst boards with larger numbers. This makes unanimous decision-making more difficult, leading to higher information asymmetry and increased external funding costs.

A further potential reason for the relationship can be explained from a managerial entrenchment perspective (Berger, Ofek & Yermack, 1995; Tarus & Ayabei, 2016). Agency theory explains that managers prefer lower leverage to allow them more managerial flexibility with access to free cash flow, increased pay, and exposure to less job performance risk. However, a smaller board size allows directors to be active managers, reducing managerial entrenchment and increasing control over management decisions. The board will thus be able to ensure a higher debt level to reduce the agency costs and limit management flexibility and access to free cash flow.

Financial education of chairperson

This study shows a negative relationship between the financial education of the chairperson of the board and leverage, as indicated by a β of -0.0316 in Table 3 and a Pearson correlation coefficient of -0.019 in Table 4. These results are interpreted as an entity whose board is chaired by a person with financial education and has a relatively lower debt in its capital structure. However, this relationship is not statistically significant in the determination of leverage.

ISBN NUMBER: 978-0-620-99843-7

This negative relationship may result from the macroeconomic market conditions over 2014-2017. During this period, the South African Reserve Bank increased interest rates from 5% to 7%, while the political uncertainty led to the credit downgrade of South African sovereign bonds to junk status in 2017, resulting in increased interest risk and decreased entities' access to credit facilities (Fitch Ratings, 2021). Chairpersons with a financial education may have better understood the financial risks and been more conservative, thus electing to reduce leverage to avoid risk and maintain operational and financial flexibility.

While these results provide an understanding of the impact the educational background of the chairperson has, the interpretation of this factor in isolation would simplify the assumption that the chairperson is solely responsible for the debt decision. While the position of chairperson holds gravitas within the board and its decisions, the board would influence the capital structure decision. Thus, it may be more relevant for future studies to consider the financial education of the board as a whole and the related impact on leverage.

Race

The regression model indicates that racial diversity of the board is not a statistically significant determinant of capital structure (β=0.0875; p-value =0.6013). Despite the lack of significance, the results identify that leverage positively affects the proportion of black directors on the board.

Further research should be conducted to investigate the impact of racial diversity of the board on costs of external funding sources before any inferences can be made as to the positive relationship between the proportion of black directors and leverage identified in this study.

CONCLUSION AND RECOMMENDATIONS

This paper aimed to examine board composition characteristics' effect on the capital structure of JSE-listed entities within a South African context. Overall, this study suggests that how the board is composed impacts the entity's decision-making, particularly concerning the capital structure decision. The relative predictive power of the model and significance of the combination of the set of variables supports this.

ISBN NUMBER: 978-0-620-99843-7

The results show that the capital structure decision in South Africa is driven by some of the same composition characteristics suggested in prior international research. Based on a sample of 61 listed entities, the study shows that board size and director independence are statistically significant factors determining leverage. Furthermore, this study attempts to add value by investigating the previously unresearched variables of racial composition and financial education of the chairperson. While these factors, in addition to gender, were not found to be statistically significant determinants of leverage, the study infers directional relationships and correlations between these factors and entity debt levels. The results indicate debt to be positively related to the proportion of female and black directors and negatively related to the chairperson's financial education.

This study provides an empirical understanding of the impact of board composition on capital structure and, ultimately, entity value through the influence of leverage on company value and performance. These findings benefit shareholders, management, lenders and institutional equity analysts. Shareholders can utilise these findings to structure their boards better to achieve desired outcomes of both financial value creation and diversity. At the same time, lenders can interpret how new board appointments will impact the financial risk the entity will be exposed to due to the resultant change in capital structure and make a more timeous assessment of credit risk with more appropriate costing on new lending.

It is important to note the study's limitations. The study used archival data contained in historical financial statements and information from integrated reports, which are subjective. Secondly, although the study considered multiple board composition factors, other important composition characteristics in a South African context, such as compensation, ownership structure, age, and variables' interaction. Additionally, this study included only four control variables. Furthermore, the study included a limited sample set of entities listed on the JSE, which may be considered a small sample and limit the generalisability of the findings. Lastly, this study was based on the static data at a point in time, and the model failed to consider what impact previous board compositions may have had on the current capital structure.

Based on the limitations, it is recommended that a future study be conducted with the inclusion of more control variables and board composition factors, as well as incorporating a factor of time to generate more robust results through an increased number of data points

ISBN NUMBER: 978-0-620-99843-7

and potentially generate a model with greater explanatory power. Furthermore, an increased sample size of entities may provide additional information. Finally, it is recommended that a study using a more detailed breakdown of leverage between current and non-current liabilities be used, given that the sample used in this research had majority of non-current liabilities, which can be argued to form part of the operating decision rather than a long-term capital structure decision.

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

AN EVALUATION OF WORKING CAPITAL PRACTICES OF SOUTH AFRICAN FIRMS BEFORE, DURING AND AFTER THE 2008 GLOBAL FINANCIAL CRISIS

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ABSTRACT

Background: The 2008 Global Financial Crisis impacted South African companies as there was a reduction in demand for the countries' exports. In addition, banks tightened their lending criteria. The lack of trade credit for working capital requirements exacerbated pressures on companies' cash flows. As a result, the financial impact of the crisis lingered for many years post the crisis. This study evaluates the effect of the global financial crisis on the working capital practices of South African firms. Using data that represents a decade before and a decade after the crisis, we examined the working capital practices of firms at a time when cash resources were scarce. The results of the panel data regressions show that the cash conversion cycle became increasingly important to the profitability of firms during and after the financial crisis. The effects of the financial crisis were still apparent a decade after the initial impact was experienced. We find support for conservative working capital management practices during non-crisis periods so as to ensure liquidity during crisis periods and for extended periods post-crisis. This is especially important as South African companies appear to have relatively low levels of long-term debt. Contribution: The study extends prior research on working capital and the global financial crisis as it uses updated data and panel regression techniques for the analysis.

KEYWORDS

Cash flows; global financial crisis; liquidity; profitability; working capital management

BACKGROUND AND INTRODUCTION

The global financial crisis had a negative impact on both advanced and emerging market economies. This event also caused uncertainty in the global markets. According to Ivashina and Scharfstein (2008), banks who had greater line exposure and reduced access to deposit financing, had to reduce their lending in comparison to other banks. Given this uncertainty, financial institutions became reluctant to lend money to each other, which resulted in the interbank funding market becoming illiquid (Baveld, 2012). Furthermore, due to the reduction in the supply of debt during this period, the policies of financing companies were adversely affected.

Firms faced financial constraints during the financial crisis due to their inability to access financial resources from capital markets. These financial constraints were driven by the restrictions imposed by banks on short-terms loans (Baveld & Bernard, 2012). This resulted in a higher cost of debt for firms. Given the restriction of the external financing, firms had to resort to alternative sources of financing, such as the management of the individual components of the cash conversion cycle (Baveld & Bernard, 2012).

When it comes to a firm's working capital policy, there are often twin goals that conflict each other. The first goal states that firms should only invest in current assets if it increases their profitability. The second goal is to ensure that a firm has adequate cash on hand to meet its short-term commitments as they fall due. The trade-off can be expressed by the maximization of a firm's returns and how it can negatively affect the firm's liquidity, and the pursuit of liquidity has the likelihood of diluting returns (Smith & Begemann, 1997). To reiterate this, Smith and Begemann (1997), noted that working capital comprised of salient goals between profitability and liquidity. According to Alavinasab and Davoudi (2013), working capital management and liquidity are seen to be the blood which circulates the firm. Similarly, Padachi (2006) describes working capital management as the heart which transport blood to vessels of a firm.

Prior research has shown that the efficient management of working capital is particularly important in situations of currency devaluation and relatively low purchasing power (for example, see Berryman (1983) and Alavinasab and Davoudi (2013)).

ISBN NUMBER: 978-0-620-99843-7

The global financial crisis resulted in an increase in the level of working capital requirements for firms. Firms faced a significant reduction in their sales, which resulted in the excessive buildup of inventories. Customers were exposed to financial and economic distress costs, which caused them to delay payments to firms for the acquisition of goods and services. These outstanding payments caused firms' accounts receivable balances to increase drastically. As a result, firms debtor balances would increase and consequently resulting in higher bad debts (Tsuruta, 2019). Given the reduction in sales and lack of cash inflows from customers, firms had to cut back on the acquisition of goods, which caused reductions in their accounts payable balance. Firms offering trade credit had to have stringent policies in place given the high probability of default given the tough economic circumstances, which also resulted in the reduction of trade payables (Raddatz, 2008). Firms who required excessive working capital requirements faced a massive liability of repayment, given the expensive sources of credit financing (Tsuruta, 2019).

There has been extensive research on the effect of the financial crisis on South African firms (for example, see Padayachee (2016) and Alami (2019)). Equally, there is no dearth of literature on the importance of appropriate working capital practices (for example, see Al Akgun and Karatas (2020) and Oseifuah (2018)). This research makes a contribution to both these strands of research by using recent data in a South African context. The present study investigates how firms listed on the Johannesburg Stock Exchange managed their working capital practices for periods before, during and after the global financial crisis.

This study will provide insight on the working capital management practices before, during and after crisis periods, with the spotlight on working capital management practices during the global financial crisis. Limited studies have been performed on working capital management practices for emerging economies.

In addition to the above, South African firms could use the results of this study to provide guidance on methods of working capital management policies in times of crisis and financial distress. This is particularly relevant as the global economy has been affected by the economic effect of the COVID-19 pandemic. This research on the impact of the global financial crisis on the working capital management practices of firms would be useful to both

ISBN NUMBER: 978-0-620-99843-7

policy makers and banks. These stakeholders can gain an understanding to create mechanisms and tools that may be used to aid firms during times of financial distress.

As evident from prior research, small inefficiencies in working capital management can go unnoticed (Alami, 2019). These small inefficiencies are amplified during times of crisis, which can impact a firm's ability to continue operating, which can result in bankruptcy of a firm. Firms need to pay attention to and manage these small inefficiencies, to ensure that a firm can remain profitable and survive during crisis periods.

This study assumes that the financial crisis period in South Africa would have been the same as the financial crisis period in foreign countries. This is because South Africa is an open economy that is reliant on foreign trade and investment (Baxter, 2009). The period from 2007 to 2009 represents the crisis period, as in Erkens, Hung and Matos (2012). According to Padayachee (2016), South Africa still felt the effects on the global financial crisis through 2009. As a result, this study incorporated 2009 as part of the crisis period. Oseifuah (2018), also makes use of the period 2007 to 2009 as the global financial crisis period. Frankel and Saravelos (2012), further states that the global financial crisis flowed into 2009. Furthermore, no research clearly illustrates the exact period when the global financial crisis occurred in South Africa. We therefore surmise that there is uncertainty regarding the period for which the economic effects of the financial crisis endured.

The study only focuses on firms listed on the Johannesburg Stock Exchange in South Africa; therefore, the findings cannot be generalized to all companies in South Africa. Only firms listed on the Johannesburg Stock Exchange are used due to the inability to obtain financial information for private and unlisted companies. The fact that only one crisis period is used (2007 to 2009), creates a limitation. By using only one crisis period, the results cannot be compared to other crisis periods to create some form of comparison. Therefore, the findings from the global financial crisis cannot be generalized to other crisis periods which occurred.

Further limitations include the use of data analysis based on annual data. Future research can be more precise if quarterly data is used for inventory, accounts payable and accounts receivable. Furthermore, we exclude the study of segregated industries due to the delineation of company's results.

ISBN NUMBER: 978-0-620-99843-7

An unbalanced panel will be used in this study. The analysis includes twenty years of data and in that time period, there were new listings and delisting from the JSE. The downside of using an unbalanced panel is that the independent variables forming part of this study will not be observed for each company for every period in question. However, the use of an unbalanced panel is better when compared to a balanced panel. This is because a balanced panel includes survivorship bias (Fitzgerald, Gottschalk & Moffitt, 1998).

Measurement proxies were used for the estimation of explanatory variables. The findings and interpretations thereof may vary if alternative approximations are used.

The study did not incorporate a regression by sector and this is highlighted as an avenue for further research.

The focus of this research is on the impact of the financial crisis. However, we acknowledge the possibility of other socio-economic factors contributing to the trend in the working capital ratios, especially since a wide time horizon had been used.

The remainder of the research paper is structured as follows: the hypotheses are developed with reference to prior literature in the next section. Thereafter the methodology is explained and results of the analysis are presented. The study concludes with recommendations for further research.

REVIEW OF PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

Tsuruta (2019) evaluated the relationship between working capital requirements and firm performance for Japanese firms during the global financial crisis. The results indicated a significant negative relationship between excess working capital and firm performance. The study also showed that the crisis-related working capital relationship with firm performance did not persist into the post-crisis period.

Oseifuah (2018), used panel data regression methods to analyse the effect of the global financial crisis on working capital management and profitability for a sample of 75 non-financial firms listed on the Johannesburg Stock Exchange for a ten-year period from 2003-2012. ROA was used as a proxy for profitability. Findings suggested that there was only a

ISBN NUMBER: 978-0-620-99843-7

significant negative relationship between accounts receivable days and profitability during the financial crisis. During this crisis period, the relationships between profitability and both the cash conversion cycle and inventory days were negative but insignificant. The relationship between accounts payable days and profitability was positive but also insignificant. Using a similar methodology and data from 2008 to 2012, Al Akgun and Karatas (2020) found a negative relationship between gross working capital and business performance. However, the latter analysis used additional proxies for profitability. Comparing these studies, we note that despite the differing measurement proxies, the results were similar.

Liquidity, profitability & value creation

An increase in a firm's cash conversion cycle would denote a reduction in a firms' liquidity, and a decrease in a firm's cash conversion cycle would indicate an improvement in a firm's liquidity (Moss & Stine, 1993). Firms face this reduction in liquidity due to the lengthening of accounts payable days, which reduces the cash conversion cycle and results in the trade-off between liquidity and profitability. Profitability can be enhanced if firms manage their working capital in a more efficient way (Gill, Biger & Mathur, 2010). Shortening the cash conversion cycle also improves the firm's profitability (Juan García-Teruel & Martinez-Solano, 2007; Tsuruta, 2019). It is apparent that the trade- off between high levels of working capital and excess cash resources presents an intriguing area for research. For example, if management alter their trade-credit policy by reducing the collection period granted to debtors, their new policy may not attract more customers due to the reduction in time given to debtors to pay for their goods or services acquired, which will result in a reduction in sales and consequently a reduction in profitability.

Liquidity & credit risk

According to Ramiah, Zhao and Moosa (2014), firms faced liquidity issues during the period of the crisis because customers were exposed to financial and economic distress costs, which caused them to delay payments to firms. Given these financial constraints during the crisis, debtors defaulted on payments. This resulted in firms facing cash flow issues, which deteriorated its liquidity positions. Furthermore, given the reduction in sales during the crisis, firms faced a buildup of inventory which further reduced their liquidity position, given that inventory was tied up in the current asset balance.

ISBN NUMBER: 978-0-620-99843-7

Interest rates, economic growth, foreign exchange rate and the inflation rate are the four key exogenous (external) factors influencing working capital requirements of a sample of Johannesburg Stock Exchange listed firms in South Africa (Oseifuah, 2016). Australian firms would enhance their credit control policies by: performing regular credit worthiness evaluations and using bank guarantees (Ramiah *et al*., 2014). Working capital management can act as a hedging mechanism against harsh credit conditions (Kesimli & Süleyman, 2011). Where firms find the optimal balance in setting their working capital policies, they can offset the effects of financial distress, especially the impact of trade credit restrictions (Ramiah *et al*., 2014). This is because banks would only provide loans to firms if they gained comfort over a firm's credit risk.

According to Kesimli and Günay (2011), firms came out stronger after a recession period when these firms adopted optimal working capital management practices during these times of recession. Maintaining current assets and current liabilities at optimal levels will ensure that firms will have sufficient cash flows to meet their short-term obligations (Akoto, Awunyo-Vitor & Angmor, 2013). Having an efficient working capital cycle means that firms reduce the risk of default payments of short-term obligations and they subsequently minimize the changes in the excessive levels of working capital (Eljelly, 2004). Firms use different working capital policies, namely: moderate, aggressive and conservative. Conservative policy means that firms attempt to match the working capital investment and financing maturities based on anticipated movements (Correia, Flynn, Uliana & Wormald, 2015). The company seeks to finance all or a portion of temporary current assets with long-term funding (Salawu, 2007). Firms opt a policy based on their respective risk appetites.

Where a firm adopts an aggressive policy and inventory levels are reduced to a low level, the firm faces the risk of losses in sales due to the inability to have sufficient inventory on hand to meet customer demands (Wang, 2002). A constrictive trade credit policy may also impact sales (by reduced credit sales), due to customers requiring trade credit (Sharma & Kumar, 2011). Several researchers have found that aggressive working capital policies enhance profitability for firms within their studies. These include Shin and Soenen (1998), Deloof (2003), Wang (2002), Raheman and Nasr (2007) and Lazaridis and Tryfonidis

ISBN NUMBER: 978-0-620-99843-7

(2006). Therefore, by reducing the investment in working capital, a firm can increase their profits.

A conservative policy ignores matching and is less risky when compared to an aggressive policy. The conservative policy generates lower returns due to long-term financing used to finance permanent current assets (Correia *et al*., 2015). The cost of capital is higher due to long-term financing; however, this policy postpones the principal payment of the debt. The conservative policy positions a higher fraction of capital in liquid assets, however this policy also foregoes profitability (Weinraub & Visscher, 1998). This implies that there may be opportunity cost or explicit financing costs (Hill, Kelly & Highfield, 2010).

From the prior research, it is apparent that firms who have a high liquidity position of working capital may face a lower risk and subsequently record a lower profit. On the contrary, firms who have a reduced liquidity position in working capital, face greater risks and therefore record higher profits. Therefore, firms must take balance the factors of risk and return in the determination and adoption of a working capital policy.

Accounts payable as a source of financing

According to Coulibaly, Sapriza and Zlate (2013), firms who relied more on trade credit, posted better sales during this period. Therefore, firms with more liquid assets and less exposure to external financing faced a smaller reduction in sales as opposed to the contrary. Coulibaly *et al*. (2013) also found that financially distressed firms received more credit during the financial crisis which relieved them from the credit crunch which resulted in the positing of better sales for these firms. This finding is consistent with the literature on trade credit and bank channels. Mainly large firms that had high cash reserves would extend credit to their customers (Baveld & Bernard, 2012; Yang, 2011). Therefore, these larger firms are seen as financial intermediaries during this period.

ISBN NUMBER: 978-0-620-99843-7

The trade-off between trade credit is shown in Figure 1 below.

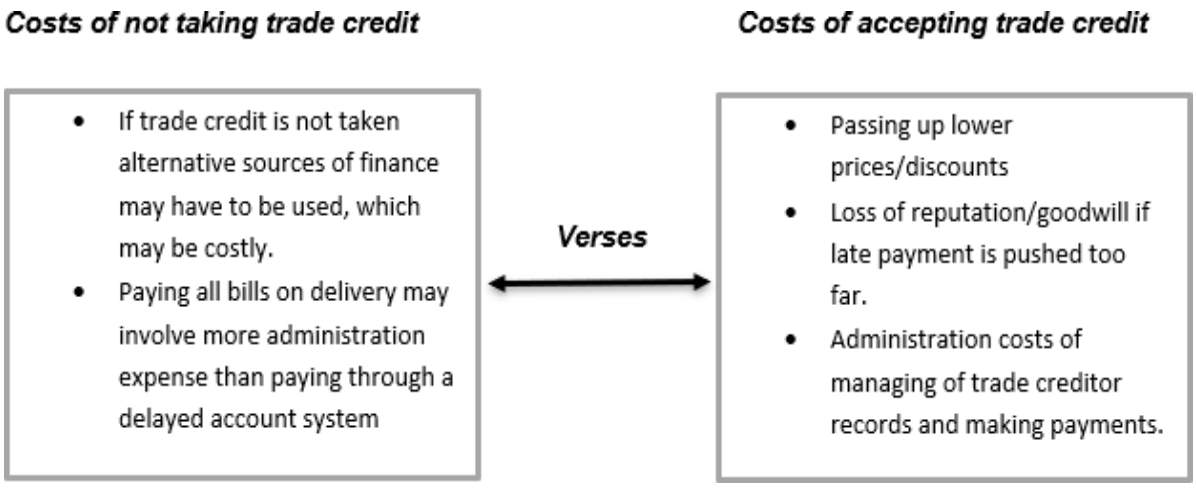


Figure 1: The credit trade-off (Source: Arnold (2008:549)

Inventory holding patterns

The financial crisis also caused sales to reduce given the cash flow constraints that some firms faced, which led to supplier firms facing a buildup of inventory. Furthermore, given the reduction of sales during this period, firms had to reduce its production of inventories and cut back on purchasing materials on credit.

Firms aim to hold and produce sufficient invetory to ensure that they meet sales demands. Furthermore, they also aim to minimize the costs associated with storing and financing such inventory (Hampton & Wagner, 1989). Firms can obtain an efficient inventory component by decreasing the following: the time raw materials spend in inventory, the time it takes to convert raw materials into finished goods and the time it takes to sell finished goods. Holding inventory in excess dampens the risk of a stock-out (Deloof, 2003; Gill *et al*., 2010; Raheman & Nasr, 2007). Firms can increase their profitability by minimizing inventory holding costs, which includes insurance and storage costs (Tauringana & Adjapong Afrifa, 2013). According to Carpenter, Fazzari, Petersen, Kashyap and Friedman (1994), changes in inventory management can be a source of funding, due to the connection between internal financing and inventory.

ISBN NUMBER: 978-0-620-99843-7

Based on the prior literature, one would expect the inventory days to increase for periods post the financial crisis. Customers would purchase more due to the favourable economic conditions post the financial crisis, thus increasing inventory turnover.

Default risk and accounts receivable

According to Ramiah *et al*. (2014), Australian firms evaluated the default risk surrounding their debtors before making any further sales on credit during the financial crisis. Furthermore, firms underwent regular credit worthiness assessments. To avoid bad debts, firms followed up late-paying customers more promptly and hired collection agencies to reduce outstanding sales. Greater cash discounts and the management of receivable days were shortened which resulted in a reduction of the cash conversion cycle and accounts receivable collection period (Ramiah *et al*., 2014).

Reducing the time it takes to collect cash from a debtor has the ability to increase profitability (Oseifuah, 2018). The manner in which a firm sets its credit collection policy directly affects their accounts receivable. The use of a liberal credit policy, increases a firm's profitability, however, firms forego liquidity due to the lengthened passage of time to collect cash from customers (Falope & Ajilore, 2009). The granting of trade credit financing to customers allows the customer to verify product and service quality before paying for such good or service (Smith, 1987).

Accounts receivable days would be expected to decrease for the period post the financial crisis as economic conditions strengthened post the financial crisis. Customers faced lower costs of financial distress and the probability of default is expected to reduce given the favourable economic conditions. Given the lower risk, customers would be expected to make timely payments within the negotiated trade credit policy terms.

Considering the constraints on financing and liquidity during and after the crisis, we expect significant changes to the manner in which current assets were managed during and after the crisis. We therefore hypothesise as follows:

H1: The global financial crisis had a significant impact on the working capital practices of South African firms.

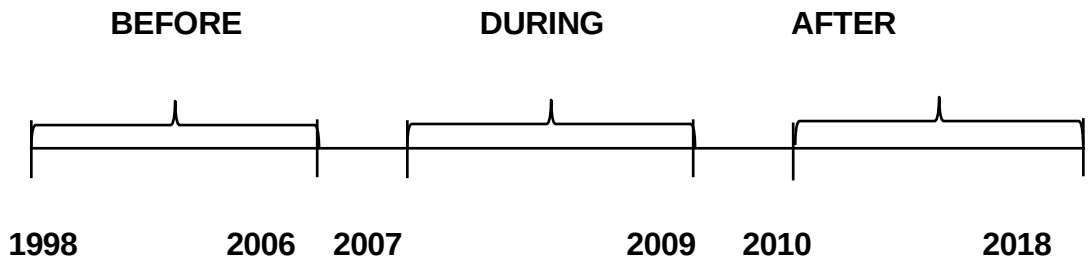
ISBN NUMBER: 978-0-620-99843-7

METHODOLOGY

The aim of quantitative research is to establish, confirm, or validate relationships (Leedy & Ormrod, 2015). This study aims to investigate how, if at all, working capital management practices changed after the global financial crisis by evaluating the impact of firm profitability on the components of the cash conversion cycle. Therefore, this study follows a quantitative research methodology with the use of a panel regression analysis. This part of the research report discusses the firms, variables, formulae and data that used in this study.

Sample and data

The purpose of this study is to examine the effects of the financial crisis on the management of working capital. This study will make use of panel data over a twenty-one-year period, grouped as follows in the timeline below.



For the purposes of this study, the population are the firms in South Africa. The sample are the non-financial firms listed on the Johannesburg Stock Exchange in South Africa. If firms are missing data for any year over the twenty-one-year period, those respective firms will be excluded for that respective year. Therefore, an unbalanced panel is used to carry out this study. The use of an unbalanced panel eliminates survivorship biasness (Fitzgerald *et al*., 1998).

The data required for this study was obtained from the IRESS Expert database. The data collected was used to calculate certain financial ratios for the years 1998 to 2018 for the firms forming part of the sample. These ratios were used for the respective regression formulae. The data obtained from IRESS Expert was stored in a Microsoft Excel 2010 spreadsheet and were used to calculate the required ratios. In addition to this, the statistical analysis was completed by an econometrician in EViews 10.

ISBN NUMBER: 978-0-620-99843-7

Details of the firms included in the sample for this study are shown in Table 1.

- **Table 1: Summary of firms included in the analysis**

No.	Industry	No. of firms	Percentage Population
1	Industrials	117	30.47%
2	Consumer Services	82	21.35%
3	Basic Materials	59	15.36%
4	Consumer Goods	53	13.80%
5	Technology	44	11.46%
6	Health care	15	3.91%
7	Telecommunications	9	2.34%
8	Oil and Gas	5	1.30%
	Total	384	100%

Model and data analysis

The aim of this study is to study the impact of the financial crisis on working capital management practices. In order to do this, a regression model (Equation 1) was used for periods before, during and after the financial crisis respectively. The model was used three times.

$$ROA_{it} \quad \beta_0 + \beta_i INVD_{it} + \beta_{it} ARD_{it} + \beta_{it} APD_{it} + \beta_{it} CCC_{it} + \beta_{it} LEV_{it} + \beta_{it} SZ_{it} + v_{it} + \varepsilon_{it}$$

(Equation 1)

The variables above are denoted as follows:

- i: represents firms
- t: represents time
- ε_{it}: represents the error term
- v_{it}: represents the individual error component (a particular characteristic of a firm)
- ROA_{it}: Return on Assets
- β_{it}: the regression co-efficient
- $INVD_{it}$: inventory days
- ARD_{it}: accounts receivable days
- APD_{it}: accounts payable days
- CCC_{it}: the cash conversion cycle

ISBN NUMBER: 978-0-620-99843-7

- $\boldsymbol{LEV_{it}}$: leverage
- $\boldsymbol{SZ_{it}}$: size

The model evaluates the impact of working capital on profitability before (1998-2006), during (2007-2009) and after (2010-2018) the financial crisis.

Return on assets was used as a dependent variable notwithstanding the numerous studies which confirm the relationship between the components of working capital and profitability (Falope & Ajilore, 2009; Gill *et al*., 2010; Oseifuah, 2018; Sharma & Kumar, 2011,). Return on Assets was selected as the dependent variable so that the components of working capital may be analysed in the context of their relationships with profitability. Table 2 contains the measurement approximations and related precedents.

Table 2: Measurement approximations

Variable	Formula	Precedent
Return of Assets (ROA)	$\text{ROA}_t \quad \frac{EBITDA_{t+1}}{\text{Total Assets}_t}$	(Juan García-Teruel and Martinez-Solano, 2007)
Cash Conversion Cycle (CCC)	$\text{CCC}_t \quad \text{INVD}_t + \text{ARD}_t - \text{APD}_t$	(Sharma and Kumar, 2011, Raheman and Nasr, 2007, Deloof, 2003)
Inventory Days (INVD)	$\text{INVD}_t \quad \frac{\text{Inventory}_t}{\text{Cost of Sales}_t} \times 365$	
Accounts Receivable Days (ARD)	$\text{ARD}_t \quad \frac{\text{Accounts Receivable}_t}{\text{Total Sales}_t} \times 365$	
Accounts Payable Days (APD)	$\text{APD}_t \quad \frac{\text{Accounts Payable}_t}{\text{Cost of Sales}_t} \times 365$	
Leverage (LEV)	$\text{LEV}_t \quad \frac{\text{Long term Debt}_t}{\text{Total Assets}_t}$	(Nazir and Afza, 2009, Deloof, 2003, Juan García-Teruel and
Size (SZ)	$\text{SZ}_t \quad \text{Ln}(\text{Sales}_t)$	

ISBN NUMBER: 978-0-620-99843-7

Variable	Formula	Precedent
		Martinez-Solano, 2007, Sharma and Kumar, 2011)

RESULTS

Regression results

For a more detailed evaluation of the impact of the financial crisis, we employed the panel regression models introduced in the Methodology Section. Untabulated results include the results of Durbin-Watson and Hausman tests which were performed to evaluate the most suitable model (fixed, random or pooled) for the regression models, VIF statistics and Breusch Pagan tests. The results presented and discussed in the rest of the section are based on the model identified as most suitable. Each model was run three times to analyse working capital ratios – once for the pre-crisis period, once for the crisis period and finally for the post crisis period.

Table 3: Regression results

***Levels of significance**: ***** p**<0.01, **** p**<0.05, *** p**<0.1*

	Before Crisis	During Crisis	After Crisis
Accounts Receivable Days	4.33E-05	-0.001838	-3.10E-05***
Inventory Days	-2.85E-09	-0.001531	-6.36E-05*
Accounts Payable Days	-9.37E-10	-2.11E-06	-1.83E-06
Cash Conversion Cycle	-1.32E-09	-0.000811	-1.15E-05***
Leverage	0.034808	-0.334624	-0.045499*
Firm Size	0.059993***	1.795702***	0.045508***
R-squared	0.16	0.11	0.17

Overall, the results show that the management of working capital became increasingly important after the financial crisis. This is evidenced by the increase in significance (at the 1% level) of the cash conversion cycle after the crisis. It may indicate that firms with working

ISBN NUMBER: 978-0-620-99843-7

capital practices that were not efficient may have been able to compensate for these practices and deliver profits before the crisis. However, for the post-crisis period, possible inefficiencies significantly impacted profitability. This notion is supported by the increase in significance of accounts receivable days and inventory days in the post-crisis period.

Accounts receivable days had a positive, though insignificant relationship with profitability before the crisis. This is unexpected based on the results of previous empirical works and the theories on working capital. It may suggest that firms were able to make profits despite having to finance extended periods of credit to their customers before the crisis. During and after the crisis period, firms were not able to do this as extended accounts receivable days had a negative impact on profitability. This relationship is significant at the 1% level for the period after the crisis, possibly evidencing constrained liquidity and non-payment from long-overdue invoices.

Similarly, inventory days is negative and significant at the 1% level in the post crisis period. The larger negative coefficient shows the increasing impact of inventory days on profitability in the post crisis period. Post the crisis period, it is apparent that slow moving inventory was strongly associated with lower profits. Again, this is possibly indicative of constrained spending in the economy post the crisis.

These postulations on working capital practices should be considered alongside the results regarding the control variables. In the pre-crisis period, leverage is positive and insignificant. The positive relationship is consistent with prior research which finds support for the pecking order theory in South African firms. However, during and post the crisis, this relationship is negative, with a 10% significance level in the post-crisis period. A key impact of the financial crisis was stricter lending criteria. Interest rates also increased post the crisis. The impact of the increased cost of debt appears to have been felt by firms post the crisis as their profits were eroded. Nevertheless, the 10% significance suggests that firms may have been shielded to some extent as a result of the low levels of leverage discussed the results of the Descriptive Statistics.

ISBN NUMBER: 978-0-620-99843-7

CONCLUSIONS, RECOMMENDATIONS FOR FURTHER RESEARCH

The study employed the use of panel data regression methodology in order to evaluate the impact of the global financial crisis on the components of working capital management practices for a sample of 384 non-financial firms listed on the Johannesburg Stock Exchange over a 21-year period (1998 to 2018). We analysed the impact of the global financial crisis on working capital management policies for firms for three interval periods: before (1998 to 2006), during (2007 to 2009) and after (2010 to 2018) the global financial crisis. The hypothesis that the cash conversion cycle was significantly impacted by the financial crisis was confirmed.

We find an increase in the importance of the management of current assets post the crisis period. It shows that the effects of delays in receipts from customers and slow-moving inventory are emphasised in times of constrained liquidity, given relatively low levels of long-term debt.

The fact that only one crisis period was used created a limitation. To enhance the validity research on the global financial crisis and its impact on working capital management practices, future studies should look to include multiple crisis periods with different causes and implications where some form of comparison can be made. Furthermore, the analysis of the present study used annual data for the study, future research can be more precise if quarterly data is used.

Future researchers should also look to evaluate working capital management practices and its impact on profitability on an industry basis. This will provide input as to the different working capital practices that each industry adopts. Future research should also look to increase the number of working capital components under investigation such as: marketable securities, cash and short-term debt due within twelve months.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

CEO Appointment Origin and Firm Performance: South African Mining Industry

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ABSTRACT

This paper investigates the effect of Chief Executive Officer (CEO) appointment origin (i.e., internally appointed versus externally appointed) within the South African Mining Industry and whether appointment origin has an impact on overall firm performance. An “external” or “outsider” is defined as a CEO appointment that has been at a company for less than two years prior to their appointment as CEO or was hired from an external source. “Internal” or “insider” CEOs are defined as those that have been employed within the same group of companies for over two years before their appointment. The paper places a fresh perspective on the field by evaluating a singular industry within a relatively unexplored emerging market. Firm performance was measured as an average of two years of Return on Assets (ROA). The effects of CEO appointments on post-appointment performance were investigated between 2012-2018 by using paired and independent T-tests as well as non-parametric Wilcoxon and Mann-Whitney Tests. The paper found that both internal and external CEO appointments were unable to create any significant post-appointment value. The decision to appoint either an external or internal CEO successor was based on firms’ pre-appointment firm performance, with external successors being selected in poorer firms and internal successors being appointed at better performing firms. The findings of this paper also contribute new knowledge to the mining industry where it found that the appointment of an internal versus external CEO makes no difference to short-term post-appointment firm performance.

KEYWORDS

Appointment; CEO; firm performance; internal versus external; mining industry; return on assets; successor

INTRODUCTION AND RATIONALE FOR THE STUDY

The academic and corporate debate surrounding CEO appointment centres around the origin of the successor CEO. An external or outsider is defined as a CEO successor that has been employed at a company for less than 2 years before their appointment as CEO or was hired from an external source. “Internal” or “insider” CEOs were defined as those that have been employed within the same group of companies for over 2 years before their appointment as CEO (Ataay, 2018; Quigley, Hambrick, Misangyi & Rizzi, 2019). “External” or “outsider” candidates are seen as fresh and dynamic successors who are able to recover failing companies and enliven already successful ones (Cannella & Lubatkin, 1993; Lauterbach, Vu & Weisberg, 1999). Conversely, these candidates are seen by others to be either disruptive or short-term focussed thereby exacerbating firms’ financial woes (Zhang & Rajagopalan, 2004). “Internal” or “insider” candidates are purported to bring stability to prosperous firms and “right the ship” when times are tough through their strong knowledge of the inner workings of the firm (Lauterbach *et al.,* 1999). On the contrary, some theorise insider CEOs continue on the same company strategy and possibly continue firms’ weak performance or remain complacent when inheriting strong pre-appointment performance by not adapting to changes in volatile conditions (Tushman & Rosenkopf, 1996). Academics have attempted to explain the effect of appointment origin through numerous theories, however, these do not stand up well against the mixed results of empirical evidence gathered so far (Quigley *et al*., 2019). Additionally, there is a lack of research in the developing markets regarding CEO appointment and its relation to firm performance (Ataay, 2018). This is compounded by the fact that South African research around this topic is limited, as no recent study has been performed within South Africa.

This research will attempt to answer whether CEO appointment origin affects post-appointment firm performance, and which type of Chief Executive Officer (CEO) origin (i.e. internal or external) is the best choice for a firm. If a clear relationship between CEO appointment origin and firm performance is able to be found, it will assist firms in avoiding agency costs, while helping shareholders maximise their value held in the firm. A more

ISBN NUMBER: 978-0-620-99843-7

successful and less disrupted firm will in turn also benefit all other stakeholders of the firm such as tax authorities, shareholders, employees, and/or suppliers.

An important consideration is why companies opt for appointing an internal or external CEO candidate in the first place. The actions of CEOs have been linked to their appointment origin (Hutzschenreuter, Kleindienst & Greger, 2012). This makes the appointment origin of CEOs an important consideration for companies. Insider CEOs have been found to more likely maintain the company's status quo, while outsider CEOs will focus on long-term strategic change (Schepker, Kim, Patel, Thatcher & Campion, 2017). Many theorists point towards Organizational adaption and disruption theories, which pit the hypothesized benefits of external and internal candidates against one another (Quigley *et al.*, 2019)**.** Understanding which theory applies in reality may result in a more informed appointment decision being able to be made by firms which may result in an improvement in firm performance in the short-term post-appointment period and thereby carry the benefits into the long-term (Georgakakis & Ruigrok, 2017).

Worldwide CEO turnover has increased from 12,9% of companies having an appointment event in 2000 to 17.5% by 2018 (Harrell, 2016; Strategy&, 2019). A large proportion of newly appointed CEOs do not meet the expectations of their firm (Harrell, 2016). It was found that up to 40% of CEOs did not perform at the expected level within the 1st year and a half of their tenure (Harrell, 2016). The CEO appointment process can therefore be an area in which a company can attempt to differentiate themselves with the right candidate by selecting a CEO from an appropriate CEO origin.

The mining industry has historically been a major driver of growth in South Africa (Pintu, 2017). The South African mining industry provides significant employment, especially to unskilled labour, a large corporate tax bill, a significant portion of the JSE market as well as an ability in attracting foreign direct investment (Antin, 2013) This sector has struggled over the past 10 years with volatile fluctuations in commodity prices, labour strikes and onerous government regulation (Mbazima, 2020). Such an important industry to the South African economy requires analysis of all facets, especially ensuring that governance of mining companies is effective in order to foster a successful industry. A strong CEO candidate will be necessary to negotiate the highly regulated industry that sees extremely powerful unions

ISBN NUMBER: 978-0-620-99843-7

and significant cost pressures from labour as well as weak basic infrastructure (Antin, 2013). A look at the appointment of CEOs may help make recommendations for increased company performance and provide evidence for future research within the industry. Additionally, the use of a specific industry provides for a homogenous and comparable setting for the analysis as opposed to an analysis of all the companies and industries making up the JSE Top 40 index. This helps to remove different industry conditions and context that can have an effect on firm performance such as upper-management demographics similarity and upper-management industry and international experience (Georgakakis & Ruigrok, 2017).

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

This literature review will explain the importance of, and risks associated with CEOs, through the lens of Agency theory. The effect of the Upper Echelon theory will also be investigated, as it is intertwined with CEOs and their effect on firm performance. The various theories of CEO appointment origin that attempt to explain CEO appointment and others that attempt to favour one appointment origin over the other shall also be described in the literature review.

CEOs' effect on firm performance and value

Agency theory is inherently intertwined with any executive directorships as they, the directors (agents), act on behalf of the principals, the shareholders (Berle & Means, 1932). *Agency theory* purports that managers, in this case Chief executives, will serve their own interests over those of the company and in turn the company will suffer from Agency costs as powerful CEOs can use their day-to-day control to increase personal wealth (Berle & Means, 1932). This can be achieved by obscuring information necessary for shareholders to assess if CEOs are destroying shareholder wealth in the company (Acemoglu, Aghion, Lelarge, Van Reenen & Zilibotti, 2006). This can be mitigated by the choice a firm makes during CEO appointment.

Chief executive officer (CEO) appointment is an integral part of the modern corporate reality and research on this topic began in the 1950s (Cragun, Nyberg & Wright, 2016). CEO appointment is a strong signalling event to stakeholders and is seen as a proxy for prior performance and likelihood of future success (Friedman & Singh, 1989). This has been

ISBN NUMBER: 978-0-620-99843-7

noted in studies that analyse the market reaction around the CEO appointment events. Rhim, Peluchette and Song (2006) found that stock markets often act favourably towards CEO appointment events. This has made this event increasingly important to boards and researchers (Cragun *et al.*, 2016). Additionally, all listed South African companies must apply King IV (Johannesburg Stock Exchange Limited, 2016). King IV recommends executive appointments should be extensively planned for and recommends that the board should be involved in the appointment of the CEO (Institute of Directors in Southern Africa, 2016).This places additional focus on CEO appointments in a South African context.

Understanding *Upper echelon theory* supports the notion that managers have a very significant ability to impact firm performance, which is an underlying assumption of the appointment theories. It theorizes that the firms' management calibre and performance in a competitive economy decides the success of the firm (Drucker, 1954). This success or failure is attained owing to the attributes of the executive's knowledge, experience, ideals, and preferences (Hambrick & Mason, 1984). The power of an average CEO to affect the variance of Return on Assets has been found to be 38.5% (Hambrick & Quigley, 2013). This is a significant figure which supports the validity of the Upper Echelon theory. CEOs have also been found to outperform peers through leadership actions and organizational design, even with substantial contextual conditions which indicates that the choice of successor could significantly affect future firm performance. Whether an individual was hired from an internal or external source can influence the amount of industry experience they come with. This may affect other demographic characteristics such as age, education, or socioeconomic roots of a CEO. Hambrick and Quigley (2013) also found that when the effect of pre-appointment performance is removed, new CEO impact is even more significant on firm performance. New CEO effect is significantly greater than previously thought when taking this into account strengthening the claims made by *Upper Echelon theory* (Hambrick & Quigley, 2013). This indicates that CEO appointment is intertwined with firm performance and the added importance of contextualizing the appointment event with pre-appointment performance.

Internal and external appointment of CEOs

An important consideration is why companies choose an internal or external CEO candidate. CEO appointment candidates' actions are driven by their appointment origin

ISBN NUMBER: 978-0-620-99843-7

(Hutzschenreuter *et al*,, 2012). Insider CEOs are likely to keep the same company strategy, while outsider CEOs will focus on long-term strategic change (Schepker *et al.*, 2017). Outsider CEOs are often selected after recent poor firm performance showing the governing body's need for change, whereas insider CEOs are brought on when a firm is experiencing strong financial performance reflecting the need for continuity (Quigley *et al.*, 2019).

Current CEO appointment trends

The want for strategic change driven by the selection of outsider CEOs, seems to have decreased over the past 2 decades. Within the CEO market, the percentage of Global Outsiders[4] making up serving CEOs has fallen from 21% in 2004 according to Strategy& (2016) to 17% in 2018 (Strategy&, 2019). 28% of CEOs have been with the company their entire career, while another 15% from other locations outside the Headquarters country, which depict some of the routes insider CEOs take on the road to appointment (Strategy&, 2019).

A large 2019 study with over 1000 appointment events, found that 43% of successors were outsiders (Quigley *et al.*, 2019). Other studies have found similar levels of outsider CEO appointment with 53.9% in a Turkish study (Ataay, 2018) and 48.9% for a Malaysian study (Ishak, Ismail & Abdullah, 2013). These studies contradict Strategy& (2019)'s analysis of the CEO market. This could be explained as studies define an "outsider" as a CEO who had joined the group of companies less than 2 years prior to the appointment event as well as those hired from external sources (CEOs hired from outside the Group) (Quigley *et al.*, 2019). The significantly higher proportion of outsiders may exist due to differences in the definition of an "outsider" CEO, as some cast a much wider net than only an outsider CEO being hired directly from external sources. It also shows that defining external successors is very important to capture the true nature of the CEO appointment event. This also highlights the importance of how academics view outsider CEOs and how the corporate world defines outsider CEOs.

4 Total sample of CEOs from external sources collected by Strategy&, which includes the CEO market in both developed and developing nations

ISBN NUMBER: 978-0-620-99843-7

Global CEO turnover has increased from 12.9% of companies having an appointment event in 2000 to 17.5% by 2018 (Strategy&, 2019). Planned CEO turnover includes CEO turnover that is according to a predefined succession plan. Planned CEO replacement has also significantly increased with 49.6% in 2000 to 68.5% in 2018 (Strategy&, 2019). This shows a clear trend towards increased focus on appointment planning. Emerging economies including South Africa, had a turnover rate of only 1.8% in 2000 (Strategy&, 2019). This showed the significant entrenchment of serving CEOs at the time. By 2018, the turnover rate was 16.6%, and 76% of these were planned appointments clearly highlighting the increased importance of CEO appointments in emerging economies which seemingly had longer tenured CEOs due to lower turnover (Strategy&, 2019). The increased turnover in developing countries has also seen an increased demand for externally appointed CEOs. In South Africa, Jack Hammer, a local executive search firm, found that 70% of their placements since 2013 were external candidates (Jack Hammer, 2018).

CEO appointment origin theories

Organizational-disruption, organizational-adaption, Scapegoating, the inertial view and *contingency* are all theories that explore CEO appointment origin and attempt to explain the firm performance effects of CEO appointment or the lack thereof (Georgakakis & Ruigrok, 2017; Ishak, Ismail & Abdullah, 2012)**.**

Scapegoating theory hypothesizes that poorly performing firms' boards will place blame on the CEO's subordinates on the board and retrench those implicated (Boeker, 1992). The subordinates will be removed and therefore the CEO will remain for the foreseeable future, thereby entrenching the CEO.

The inertial view could be seen as the natural progression of *Scapegoating theory*. It proposes that the appointment process is flawed as those involved have vested interests (Shen & Cannella, 2002). This means that firms do not adapt to changing conditions even when performance is poor and look inwards to internal CEO successors for the eventual replacement of the CEO. *The contingency view* looks at socio-political factors that affect the relationship between the CEO and board and how these factors can affect firm performance when performance information is similar (Cannella & Lubatkin, 1993). This theory supports the notion that firm performance is more dependent on the relationship between CEO and

ISBN NUMBER: 978-0-620-99843-7

board, which can be influenced by what kind of successor is appointed with internal successors being less socially disruptive due to their former presence within the firm (Cannella & Lubatkin, 1993).

Organizational adaption predicts that an externally appointed CEO will be a benefit to the company owing to their accumulated external knowledge of the industry and market in comparison to internally appointed CEOs (Cannella & Lubatkin, 1993). This will mean that the firm can increase its resource base, innovation, knowledge and firm performance (Cannella & Lubatkin, 1993). Internal successors have been found to have less financial expertise, resulting in poorer financial reporting (Rezaee, Asiaei & Delooie, 2021). External successors can be seen as solutions to financial troubles, as they bring new ideas and are not weighed down by the firm's culture, thereby creating value by removing entrenched inefficiencies within the organization (Lauterbach *et al.,* 1999). This theory has become increasingly more popular as the proportion of external CEO candidates has increased significantly since the 1980s (Harrell, 2016). External CEOs currently make up 17.5% of appointments, a low point in the decade (Strategy&, 2019). This is compared to only 8-10% of appointment being external hires in the 1980s (Harrell, 2016).

Organizational disruption takes the opposing view that an externally appointed CEO will lead to a disruptive event which will lead to the firm incurring costs (Zhang & Rajagopalan, 2004). Internal successors are seen to be a continuity of the current trajectory, their internal knowledge of company and social relationships within the firm will enable a smooth transition and stability (Lauterbach *et al.,* 1999). This will shorten the onboarding process leading to improved short-term performance (Boeker, 1992). There would also be the added benefit of improved employee sentiment as the possibility of upward promotion is viable (Lauterbach *et al.,* 1999). Conversely, external successors are seen as a threat by individuals already within the organization (Lauterbach *et al.,* 1999). This can lead to disharmony and is an example of the agency costs a firm may experience as a result of an external CEO hire.

Newer studies have suggested that external appointees contribute to greater firm performance in emerging markets than in developed markets and that there are different contingencies for appointment to that of developed markets (Ataay, 2018). This could either be due to external CEOs being or perceived as being less disruptive in developing nations

ISBN NUMBER: 978-0-620-99843-7

or internal CEOs who historically faced little risk of turnover, thereby becoming complacent. This supports the organizational adaption theory. Internal appointment was negatively related to performance while external appointment had a positive relationship with performance. Positive pre-appointment performance also led to improved post-appointment firm performance for external appointments (Ataay, 2018). This relationship would imply that a significant amount of performance after CEO appointment is a moderating variable on recent firm performance and external successors do not cause significant disruption costs.

Not all papers however are as conclusive. A CEO appointment paper that focused on external and internal appointment in Malaysia, another developing nation, found no significant relationship between CEO selection choice and firm performance (Ishak *et al*., 2013). Older evidence in the United States shows no correlation between the firm performance and the organizational adaption or disruption theory respectively (Lauterbach *et al.,* 1999).

Poorer performing firms selected external candidates at a higher rate whereas larger and often better performing firms appointed internal candidates at a higher rate (Lauterbach *et al.,*1999). This may be due to the smaller group of candidates' that smaller firms have to choose from while larger firms have greater turnover and a larger pool of internal options (Hambrick, Finkelstein & Cannella, 2009).

Research has not been conclusive regarding which theory applies to CEO appointment origin. Georgakakis and Ruigrok (2017) finds that both adaption and disruption theories can be relevant depending on internal and external context of the firm. These include top management similarity, top management industry and international experience variety (Georgakakis & Ruigrok, 2017). The context of a single industry is therefore more appropriate due to the comparable context from firm to firm as industry and international experience will vary less. The relationship between firm performance and CEO appointment origin does not fit neatly into an appointment origin theory in a general context. The mixed results are well noted in the literature of CEO appointment theory. An extensive meta-analysis of 13 578 appointments attempts to explain this phenomenon. They claim it is due to the adaption and disruption theories being complimentary and not mutually exclusive (Schepker *et al.*, 2017). They hypothesize that disruption effects of externally appointed

ISBN NUMBER: 978-0-620-99843-7

CEOs are felt in the short-term post-appointment and any organizational adaption benefits are only realised over the long-run (Schepker *et al.*, 2017). The meta-analysis found that internal successors were less disruptive in the short-term, and that long-run performance is better for the less disruptive internal successor CEOs whereas external successor CEOs' performance suffer from their strategic changes to the organization (Schepker *et al.*, 2017). This therefore supports the disruption theory, and that the appointment event would have negative financial effects for the firm.

RESEARCH DESIGN AND METHODOLOGY

The research project makes use of t-tests and non-parametric tests, which include the Mann-Whitney U and the Wilcoxon signed-rank test. These were used to determine whether there was a significant difference between the mean post-appointment firm performance and pre-appointment firm performance of both internally and externally appointed CEOs. These tests aim to discover whether a CEO appointment event has a financial effect on the firm, whether internal and external CEOs can affect post-appointment firm performance more than one another and whether internal and external successors begin with strong or weak pre-appointment performance. A paired t-test and a Wilcoxon signed-rank test was used on the internal and external successors samples separately.

Sampling

Firms

Firms included in the study are those that are considered part of the South African Mining industry. These are, Mining, Industrial Metals & Mining, and Oil & Gas Producers listed on Johannesburg Stock Exchange (JSE). Data was collected from africanmarkets.com and listcorp.com to cast the widest possible net on the industry. Initially both Oil and Gas and Mining as well as Mining and Industrials operations were included in the initial sample. Any companies with inappropriate operations were excluded as these companies' operational context would differ significantly from a traditional mining company. This was determined by using the Mining production index and the minerals that are included in this index and comparing this to the operations of the firm using the Bloomberg terminal description (Stats SA, 2021). Therefore, most Oil & Gas firms were excluded, except for significant coal miners. Steel producers that do not mine iron ore were also excluded. These companies were then vetted on the Bloomberg Terminal where other data was collected such as firm performance

ISBN NUMBER: 978-0-620-99843-7

indicators and CEO appointment origin. Collection of the internal vs external appointed CEOs was to be performed manually by accessing the former employment of each appointed CEO. This means there was no ambiguity as to whether they were internally or externally appointed.

Delisted companies, those in liquidation, business rescue or with suspended listings 2 years after CEO appointment were included to avoid survivorship bias. The period for statistical testing of appointments fell between 2012-2018 to exclude any effect of the financial crisis on appointment and provide a relevant analysis of recent results within a reasonably short time period.

Performance measures considered

Tobin's Q is a mixture of market and accounting measures and is often used in research as a proxy for firm performance (Bhagat & Bolton, 2008). Advantages of this measure include the mixture of market and accounting figures being able to capture historic and future performance. The disadvantage is the definition of inputs to create Tobin's Q are not always consistent and the figure is still affected by significant market shocks for which management cannot control (Bertrand & Mullainathan, 2001).

Total shareholder return (TSR) is a market-based measure. TSR is used as a universal performance measure for all CEOs through portals such as Bloomberg Terminal (Hansen, Ibarra & Peyer, 2010). The obvious problem with Stock return/TSR is that market sentiment is susceptible to investor anticipation, thereby inflating performance before any fundamental change has been made (Bhagat & Bolton, 2008). The use of a market-based figure also accounts for factors that may be out of the control of an executive, unlike accounting figures (Bertrand & Mullainathan, 2001).

Return on Assets (ROA) is an accounting figure which is commonly used to assess firm performance and the related effect of CEO appointment (Cannella & Shen, 2002). It is an accounting figure and therefore is more susceptible to management manipulation than market based figures (Bertrand & Mullainathan, 2001). It is often not calculated with the same inputs thereby reducing its comparability (Jewell & Mankin, 2011).

ISBN NUMBER: 978-0-620-99843-7

ROA was however, chosen as the performance measure as it is an accounting figure, meaning it will not be affected by market sentiment (Bertrand & Mullainathan, 2001). Additionally, TSR and Tobin's Q were not easily applicable to the two-year period and data was often missing for many companies. ROA was also by far the most accessible figure and was standardized on the Bloomberg Terminal, from where it was gathered, eliminating the risk of inconsistencies, often posed by ROA calculations. Additionally, CEOs can significantly affect the variance of ROA - an average CEO can affect 38.5% of the variance of Return on Assets and over-achieving CEOs can affect the variance even more significantly (Hambrick & Quigley, 2013). Therefore, this is a measure over which CEOs have significant influence over during their tenures and appropriately measures their ability as proposed by the Upper Echelon theory.

CEOs and origin

An external or outsider is a CEO successor that arrived less than two years before their appointment or was hired from an external source (Ataay, 2018; Quigley *et al.*, 2019). Internal or insider CEOs are those that have been within the same group of companies for over two years before their appointment.

Appointments of Deputy CEOs were excluded as these are normally accompanied by a CEO that is senior in rank to the deputy. This was ignored as this is an appointment planning measure and would not affect the performance being reviewed.

CEOs, Interim CEOs, and Managing Directors were also considered as CEOs in the absence of a CEO. This paper aims to assess firm performance and its relationship with the internal or external appointment of an executive officer that is considered to hold the most senior position. Founder CEOs were excluded as they do not have pre-appointment performance that is measurable as well as the fact they are essentially not appointed. Additionally, tenures of CEOs were recorded as a result of recording appointment dates, and this was used to observe some of the possible long term-effects of appointment and performance.

ISBN NUMBER: 978-0-620-99843-7

Method and data

Post-appointment performance was measured as a ROA percentage (annual figures) averaged over two financial years after the appointment of the CEO. Using an average rather than change in ROA allows for the data to be less likely to include outlying events that may skew the data collected (Cannella & Shen, 2002).

Pre-appointment performance was also included in the analysis. ROA percentage, averaged over two financial years (annual figures) preceding appointment, was used to depict pre-appointment performance. This is because pre-appointment performance is seen as a concomitant of CEO performance implications as it contextualises the environment in which CEOs are appointed (Ataay, 2018).

The two years of pre-appointment firm performance could be used as an indicator of why CEO appointment occurred, as often two consecutive years of poor performance led to CEO turnover (Boeker, 1992). The pre-appointment was also used to test whether it is a moderating factor in CEO appointment and firm performance and to test whether pre-appointment had influence over both variables.

Due to the timing difference that arises from the use of annual figures and the point of CEO appointment, the year in which the CEO is appointed was ignored as that year could account for decisions made by both predecessors and successors (Pourciau, 1993). The ignoring of the appointment year of the CEO also accounted for onboarding and the process of inducting the CEO, which can take up to 6-12 months in most companies and eighteen months for larger firms (Cragun *et al.*, 2016; Manning, 2017). The use of two years of post-appointment firm performance was to allow for CEO onboarding to take effect so that the CEO would be able to affect firm performance at their most settled while still in the short run.

ISBN NUMBER: 978-0-620-99843-7

Table 1: Summary of tests

Test No.	Parametric Test	Non-parametric Test	What is being tested?	Hypotheses
Test 1	Paired t-test	Wilcoxon signed rank	Total pre-appointment VS Total post-appointment	Does CEO appointment influence firm performance?
Test 2	Independent t-test	Mann-Whitney U	External post-appointment firm performance VS internal post-appointment firm performance	Do internal or external CEO appointments result in better firm performance?
Test 3	Paired t-test	Wilcoxon signed rank	Internal pre-appointment firm performance VS Internal post-appointment firm performance	Can internal CEO successors improve firm performance?
Test 4	Paired t-test	Wilcoxon signed rank	External pre-appointment firm performance VS External post-appointment firm performance	Can external CEO successors improve firm performance?
Test 5	Independent t-test	Mann-Whitney U	External pre-appointment firm performance VS Internal pre-appointment firm performance	Does an internal or external CEO successor begin in a better financial position?

Assumptions: Tests 1, 3 and 4

A paired t-test and Wilcoxon signed-rank test was used.

To perform a paired t-test, the following assumptions should be met:

1. **Data must be either ordinal or continuous**. The Return on Assets used in all tests, is continuous, therefore meeting this assumption.
2. **The sample should be randomly selected and be representative of the total population**. This assumption is robust and can be violated if the sample size is large enough. The sample size is 30 out of 76 recorded events from 2002-2021. The data was not selected in any particular way; however, random selection method was not applied and therefore the data was not randomly selected.
3. **The data should result in a normal distribution of data**. This assumption is robust and can be violated. In order to meet this requirement, I used a “Descriptive statistics” test on the data set on excel. This produced an output which tests the Kurtosis and Skewness of the data. If both these figures fall within -2:and +2, the data should approximate a normal distribution and therefore be appropriate for a t-test. When t-tests were seen as appropriate, both a non-parametric test and a t-test were used

ISBN NUMBER: 978-0-620-99843-7

due to the test being an approximation of normality and not actual normality. Therefore, more weight would be placed on the results of the non-parametric results.

4. **The sample size should be reasonably large.** Out of the results collected, 76 events were found in a period 2002-2021, 30 were usable, indicating a relatively large sample size in relation to the total population. All other samples in the following tests also met this requirement as these also include samples of 30 and 60.
5. **Variances in the samples should be homogenous,** however this assumption is robust and can be violated if the samples are of similar sizes. No evidence could be found to prove the heterogeneity of variances (P-value>0,05). The internal and external appointment events are of very similar sizes at 14 internal appointment and 16 external appointment events in test 3 and 4. In test 1, 14 internal appointment and pre-appointment events and 16 external appointment and pre-appointment events were used also depicting similar sample sizes.

Therefore, the use of a paired t-test is still appropriate yet may be less effective as some assumptions have been violated. Therefore, a Wilcoxon signed ranked test was used, which is non-parametric and does not require a normal distribution.

Assumptions: Tests 2 and 5

An independent t-test and Mann-Whitney U test was used.

1. **Observations should be independent**. There is no relationship in test 2 as post-appointment firm performance of external and internal CEOs is being compared. There is no relationship in test 5 as pre-appointment firm performance of external and internal CEOs is being compared.
2. **There should be no outliers**. Only test 5 includes 1 outlier of an ROA of 58,71 (outside 3 standard deviations of 54,86). Therefore, only the Mann-Whitney will be used in this test.
3. **The data should be normally distributed.** The same test was used as above for the previous test of normality.
4. **Variances should be homogenous.** No evidence could be found to prove the heterogeneity of variances (P-value>0,05).

ISBN NUMBER: 978-0-620-99843-7

5. **Data must be either ordinal or continuous**. The Return on Assets used in all tests, is continuous, therefore meeting this assumption.

Test 1

Is there a statistically significant difference between the entire sample of appointments of pre-and post-appointment performance? Do external or internal successors bring better or worse firm performance in the short-term post-appointment?

3) Test for normality:

Skewness is well within the range and close to 0 at -0,22. Kurtosis is 4,73, which is greater than 2, meaning the distribution is unlikely to be normal due to larger than normal tails to the distribution. Therefore, a Wilcoxon signed-ranked t-test was used.

Hypothesis 1

Null Hypothesis 1: There is no effect on firm performance due to the appointment origin of the CEO.

H0: μTotal pre-appointment firm performance = μTotal post-appointment firm performance

Hypothesis 1: CEO appointment influences firm performance.

H1: μTotal pre-appointment firm performance ≠ μTotal post-appointment firm performance

Test 2

Is there a statistically significant difference between internal and external post-appointment performance? Do external or internal successors bring better firm performance in the short-term post-appointment period?

An independent t-test and a Mann-Whitney U test was used. Paired t-test assumptions are the same as an independent t-test, except that the variables must be independent of one another. External and internal post-appointment firm performance are independent of one another.

ISBN NUMBER: 978-0-620-99843-7

3)Test for normality:

The sample approximates normality as skewness is close to 0 at 0,3 and kurtosis is 1 which is within the -2 to +2 limits.

Therefore, the t-test is appropriate in this case, coupled with a Mann-Whitney U test.

Hypothesis 2

Null hypothesis: There will not be a significant difference in the means of the post-appointment performance of an internally and externally appointed CEO.

H0: μExternal post-appointment firm performance ≥ μInternal post-appointment firm performance

Hypothesis 2: Internal successors will have better post appointment firm performance than external successors.

H2: μExternal post-appointment firm performance < μInternal post-appointment firm performance

Test 3

Is there a statistically significant difference between internal successors' pre and post appointment performance? Do internal successors improve firm performance from their pre-appointment base?

3) Test for normality:

Skewness is well within the range and close to 0 at -0,25. Kurtosis is 4,35, which is greater than +2, meaning the distribution is unlikely to be normal due to large than normal tails to the distribution. Therefore, a Wilcoxon signed-ranked t-test.

Hypothesis 3

Null Hypothesis: Internal successors do not improve firm performance from their pre-appointment base.

H0: μInternal pre-appointment firm performance ≥ μInternal post-appointment firm performance

ISBN NUMBER: 978-0-620-99843-7

Hypothesis 3: Internal successors will improve firm performance from their pre-appointment base.

H3: μExternal pre-appointment firm performance < μExternal post-appointment firm performance

Test 4

Is there a statistically significant difference between internal successors' pre and post appointment performance? Do external successors improve firm performance from their pre-appointment base?

3) Test for normality:

The sample approximates normality as skewness is close to 0 at -0,005 and kurtosis is 0,48 which is within the -2 to +2 limits. Therefore, the t-test is appropriate in this case, coupled with a Wilcoxon signed rank test.

Hypothesis 4

Null Hypothesis: External successors will not improve firm performance from their pre-appointment base.

H0: μExternal pre-appointment firm performance ≥ μExternal post-appointment firm performance

Hypothesis 4: External successors will improve firm performance from their pre-appointment base.

H4: μExternal pre-appointment firm performance < μExternal post-appointment firm performance

Test 5

Is there a statistically significant difference between internal successors' pre and post appointment performance? Do internal or external CEO successors begin with better pre-appointment performance?

3) Test for normality:

ISBN NUMBER: 978-0-620-99843-7

The sample does not approximate normality as skewness is appropriate at 0,25, and kurtosis is 4,32 which is well outside the -2 to +2 limits. Therefore, the t-test is not appropriate in this case. Therefore, a non-parametric Mann-Whitney U test was used.

Hypothesis 5

Null Hypothesis: Internal successors do not begin with better pre-appointment firm performance.

H0: μExternal pre-appointment firm performance ≥ μInternal Pre-appointment firm performance

Hypothesis 5: Internal successors begin with better pre-appointment firm performance.

H5: μExternal pre-appointment firm performance < μInternal Pre-appointment firm performance

RESULTS

Observations

71 possible mining companies were identified. Three of which had founder CEOs and were excluded from the analysis. Four others had no board structure recorded and were excluded. The total number of appointments therefore recorded were 76 appointments (after excluding the appointments mentioned previously). Of that, 41 (53.95%) of appointments were external successors and 35 (46.05%) were internal successors. This mirrors most studies with similar parameters (Ataay, 2018; Ishak *et al.*, 2013; Quigley *et al.*, 2019).

74 of the 79 (including founders) CEOs identified in the study were male (96%) with 6% female CEOs. This is slightly higher than the global average of 4.9%, but is still disparaging with such low levels of gender equity in the CEO position (Strategy&, 2019).

ISBN NUMBER: 978-0-620-99843-7

Table 2: CEO makeup

Type of appointment	Number of events	Percentage
Internal	35	46.05%
External	41	53.95%
Founder	3	
No data	4	
Total	83	
Subtotal: Appointment candidates	76	

Table 3: Total sample of successor CEOs' former positions

Former Positions of CEOs: Entire Sample	Number (79)	Percentage
CEO	19	24%
Executive Board member	19	24%
Non-executive	6	8%
Top Management	15	19%
Other	12	15%
CFO	8	10%

24% of successors were already CEOs prior to their election, which is not surprising as firms would attempt to recruit experienced individuals for the CEO position. Other board positions including Non-executives, the CFO (Chief Financial Officer) and other executive board members make up another 42% of successors. Top management includes those managers that do not form part of a board, for example a divisional General Manager or Vice President. At 19% of successors, this is a significant component, indicating that company boards likely wanted to gain more direct operational knowledge and experience from this type of selection. "Other" at 15% of successors includes Legal counsel, company secretaries, founders, investors, and consultants. These kinds of appointments may be made on merit

ISBN NUMBER: 978-0-620-99843-7

of the individual or skills outside of purely management, due to the lack of Corporate Governance experience they possess.

Table 4: External successors former positions

Former Positions: External	**(40)**	**Percentage**
CEO	12	30%
Executive Board member	10	25%
Non-executive	3	8%
Top Management	6	15%
Other	5	13%
CFO	4	10%

30% of external successors were in CEO positions beforehand and another 43% of external successors were in another board position. This shows the desire for an external CEO to bring relevant knowledge and skills from the market to begin the turnaround without requiring significant training. The significant proportion of former CEO successors elected may also explain the increased turnover of CEOs in recent years within the South African CEO market, as CEOs move from position to position within the industry (Strategy&, 2019).

ISBN NUMBER: 978-0-620-99843-7

Table 5: Internal successors former positions

Former Positions: Internal	(35)	Percentage
CEO	7	20%
Executive Board member	9	26%
Non-executive	2	6%
Top Management	9	26%
Other	4	11%
CFO	4	11%

20% of internal successors are CEOs. These are CEOs from with the company group or regional division CEOs. 26% of internal CEOs were “Top Management” as opposed to the 15% of external successors. In an internal setting “Top Management” can be rewarded for good performance by the company. External appointment of this kind is less likely to happen as it is riskier for the firm to measure performance and experience from an external perspective. Internal “Top Management” appointment also speaks to the knowledge of internal operations and processes, that external successors in the “Top Management” category may not be familiar with, requiring an onboarding process for both Corporate Governance and operations. It is slightly concerning that 6% of internal successors were non-executives. This is because it calls into question the governance practices of the firm and the independence of the executives prior to their appointment according to King IV principles (Institute of Directors in Southern Africa, 2016).

Average internal successor tenure (6.69 years) is just over a year longer than average external successor tenure (5.67 years) as of 1 July 2021. This is likely due to internal successors being more entrenched within the board through the *Inertial view and Scapegoating* (Boeker, 1992; Cannella & Shen, 2002). External successors are often seen as a short-term turnaround solution and if this is unsuccessful, they could be removed. Additionally, appointment benefits weaken in the long run and are insignificant, meaning any

ISBN NUMBER: 978-0-620-99843-7

benefits gained from an external appointment are lost in the long run (Georgakakis & Ruigrok, 2017; Quigley *et al.*, 2019).

36 of the 76 appointment events could not be used in the analysis as there was insufficient ROA data. Another nine appointments were excluded as these would have been affected by the financial crisis, while one company delisted during the 1st two years of the tenure of the CEO. Lastly, three appointments were excluded due to inappropriate operations by the company. This left 14 internal appointments and 16 external appointments to analyse, all of which fell between 2012-2018.

Table 6: Summary of results

Test	Variable	Period of firm performance	Mean (%)	P-Value T-Test	T-statistic non-parametric
1	2-year Average ROA	Total Pre-appointment	-0.1798	0,655	231
1	2-year Average ROA	Total Post-appointment	0.9703		
2	2-year Average ROA	External Post-appointment	-1.9125	0,069	62**
2	2-year Average ROA	Internal Post-appointment	4.2650		
3	2-year Average ROA	Internal Pre-appointment	5.0036	0,429	46
3	2-year Average ROA	Internal Post-appointment	4.2650		
4	2-year Average ROA	External Pre-appointment	-4.7153	0,201	60
4	2-year Average ROA	External Post-appointment	-1.9125		
5	2-year Average ROA	Internal Pre-appointment	5.0036	0,074	56**
5	2-year Average ROA	External Pre-appointment	-4.7153		

Non-parametric: **indicates the result was significant as t-stat<critical value

ISBN NUMBER: 978-0-620-99843-7

Hypothesis 1 results

Hypothesis 1: CEO appointment influences firm performance.

Average pre-appointment firm performance of internal and external successors was an average ROA of -0,18%. Post-appointment improved to an average ROA 0,97% (637% increase). This change in performance seemed to indicate that an appointment event would mean significant positive change. This would line up with the markets' view of an appointment event as a positive event and dispute the significance of disruption costs to the firm. This change was found not to be significant as the Test statistic was greater than the critical value and therefore the null hypothesis could not be rejected (Test statistic 231>137 Critical Value). There is therefore no effect on firm performance due to the appointment event of a CEO. This means that the effect of CEO appointment on firm performance is not statistically significant when excluding the effect of the internal and external distinction.

Hypothesis 2 results

Hypothesis 2: Internal successors will have better post appointment firm performance than external successors.

When isolating only post-appointment firm performance internal successors performed much better with an average ROA of 4.27%, whereas external successors performed worse with an average ROA of -1.91%. This difference was not statistically significant as the Test statistic was greater than the P value (Test statistic 0,069>0,025 P-value) when using the t-test. The Mann-Whitney found a significant difference as the U-critical value was greater than U-Statistic (Test statistic 62<64 Critical value). Therefore, the null hypothesis was rejected, and it was found that post-appointment of internal CEOs was statistically significantly better than external CEO successors' post-appointment performance. Internal successors performed better than external successors in CEO appointments event (H2). This is contrary to the findings of Ataay (2018) which found internal successors to destroy value. This difference could be explained by the significantly better starting position that internal successors are bestowed as discovered in Test 5, in which internal successors were found to have statistically significant better financial starting positions. Internal successors seemed to destroy value, which was not statistically significant, whereas external CEOs managed to improve overall ROA (also not statistically significant).

ISBN NUMBER: 978-0-620-99843-7

Hypothesis 3 results

Hypothesis 3: Internal successors will improve firm performance from their pre-appointment base.

When accounting for the effect of pre-appointment firm performance on internal successors it was found that the pre-appointment base was strong at an ROA of 5% with a decrease to 4.27% after appointment (14.76% decrease). This was not statistically significant as the Test statistic was greater than the critical value and therefore the null hypothesis could not be rejected (Test statistic 46>25 Critical value). Internal CEO successors do not improve firm performance from their pre-appointment base. The lack of change indicates that internal successors are not disruptive, however the lack of value creation indicates that the organizational benefits of internal successors were not recognized in the South African Mining Industry. This lack of value creation could be attributable to the lower expectations of insider CEOs and greater ability of insiders to place blame on external factors such as economic conditions (Cannella & Lubatkin, 1993).

Hypothesis 4 results

Hypothesis 4: External successors will improve firm performance from their pre-appointment base.

Pre-appointment firm performance was also accounted for with external appointments. External successors started out with a significantly worse average pre-appointment of ROA of -4.72% as compared to internal successors' 5%. External successors managed to improve firm performance to -1.91% (59,44% increase). This was found not to be statistically significant as the Test statistic was greater than the p-value (P value of 0,20>0,025 Test statistic 1-tailed test) as well as the Wilcoxon test finding the Test statistic to be greater than the critical value (Test statistic 60>35 Critical Value). External CEO successors therefore do not improve firm performance from their pre-appointment base. The negative financial performance and non-significant improvement may possibly be explained by external CEOs being placed into an environment which has an unsupportive top management (Cannella & Shen, 2002) as well as not being able to implement any informational benefits gained due to the weak financial position (Zhang & Rajagopalan, 2004).

ISBN NUMBER: 978-0-620-99843-7

Hypothesis 5 Results

Hypothesis 5: Internal successors begin with better pre-appointment firm performance.

Pre-appointment firm performance of successors was vitally important to analyse in determining the effect it would have on their post-appointment performance. As stated above, the base to which internal successor CEOs started with was a ROA of 5% whereas external successors had a negative starting point of -4.72%, indicating poor firm performance. The difference of pre-appointment firm performance of external successor CEOs and internal successor CEOs was found to be statistically significant, and the null hypothesis could be rejected (U-stat 56 < 64 U-critical value). Internal successors begin with better pre-appointment firm performance (H5). Therefore, external successors were elected when financial performance was negative whereas internal successors were seen as custodians of average and good performance. This shows that governing bodies in the South African Mining industry make similar decisions to those seen before in other studies and industries and apply the more commonly accepted theory that external successors can improve poor firm performance. These boards see the potential turnaround of performance from outsider CEOs, driven by their push for strategic change and disruption (Lauterbach *et al.,* 1999). These decisions seem to contradict evidence found that external CEOs can benefit an already well performing firm which will not be financially prevented from informational benefits brought by the new CEO due to a weak financial state (Zhang & Rajagopalan, 2004). The significance of the pre-appointment difference also highlights the need to account for pre-appointment performance when comparing internal and external CEO candidates. Pre-appointment was also shown to be a moderating variable for post-appointment firm performance as it influenced both appointment type as shown in Test 5 and was depicted in the results of test 2, as internal successors were shown to perform significantly better without accounting for pre-appointment firm performance.

CONCLUSION

This research finds that externally and internally appointed CEOs do not perform significantly better than one another when accounting for pre-appointment performance. Internal appointments did not manage to create any value, however post-appointment performance of internal successors was better than external successors due to their stronger pre-appointment firm performance. Neither external nor internal successors were able to improve the firms' financial position from the pre-appointment state. These results

ISBN NUMBER: 978-0-620-99843-7

find CEO appointment results to have no clear effect on firm performance in total as well as when accounting for the internal and external CEO successors. Pre-appointment performance also seems to be a determinant of the type of successor chosen by boards, with poor performing firms selecting external CEO candidates and better performing firms choosing internal CEOs.

The *Scapegoating and inertial views* would be difficult to observe from the outside. However, the fact that poorly performing firms selected external CEO successors lends itself to the fact that governing bodies in the industry did not fall prey to these practices.

The *contingency view* was not deeply delved into within the paper; however, the inconclusive results could be attributable to socio-political factors within the firms and industry. The internal successors would be seen to be less socially disruptive as having been part of the company social structure, however external successors were not found to be any more or less disruptive. The successors were fairly homogenous regarding gender, industry, and industry experience. Age, race, and qualifications as well as other relevant factors were not accounted for regarding their effect on firm performance.

The results do not support the *Organizational Adaption* or *Organizational Disruption* theories. These inconclusive results follow on from a long trend of mixed results and despite attempting to control for the *contingency view* by using a single industry and region, has not yielded a clear answer. The context of a developing market like South Africa did not yield decisive results as predicted. This would indicate that the choice of an internal or external CEO candidate should not be made based on predicted future performance due to the type of candidate, but by the merit of the candidate and specific requirements present within the firm. Therefore the decision should depend on the talent pool at the firm, which often pales in comparison to the industry (Cremers & Grinstein, 2008). Additionally, outsider CEOs have greater bargaining power and generally receive larger fixed-pay packages than insiders (Elsaid, Davidson & Wang, 2011). This is an additional consideration for firms when deciding on a CEO, especially when financially distressed.

ISBN NUMBER: 978-0-620-99843-7

LIMITATIONS AND FURTHER RESEARCH

The sample size of the study would have been preferably larger. This was limited by the industry scope as well as the effects of the financial crisis and the comparability of older data available. The study was limited to accounting figures (ROA) and future research could include a cross-sectional analysis of a more complete data set.

The size of the firm was not taken into account, however current market capitalization (proxy for firm size) of useable data found that internal successors were selected at larger firms while on average, smaller firms selected outsiders which could be further investigated (Lauterbach *et al.*, 1999). The inconclusive results that pervade the current and past research of CEO appointment may have led to new explanations for these differing results. A new paper by leading authors in the field, attempts to find that external successor CEOs results do not follow either *Adaption* or *Disruption* theories, but rather external successors lead to more extreme results in financial performance (Quigley *et al.*, 2019). This is a potential explanation for the inconclusive results and an area of possible future research.

ISBN NUMBER: 978-0-620-99843-7

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APPENDICES

Appendix 1: Companies

No.	Company name	JSE code	Sector
1	Kibo Energy Plc 1	KBO	Mining
2	Resource Generation Limited	RSG	Mining: Coal producer
3	MCMining Limited 2	CZA	Coal Mining
4	Chrometco Limited	CMO	Industrial Metals & Mining
5	Assore Limited	ASR	Industrial Metals & Mining
6	Impala Platinum Holdings Limited	IMP	Mining
7	Wesizwe Platinum Limited	WEZ	Mining
8	Eastern Platinum Limited	EPS	Industrial Metals & Mining
9	Sasol Limited 2	SOL	Oil & Gas Producers
10	Bauba resources	BAU	Mining
11	Wescoal holdings LTD 2	WSL	Industrial Metals & Mining
12	Alphamin Resources Corporation 2	APH	Mining
13	Harmony Gold Mining Company Limited	HAR	Mining
14	Northam Platinum Limited	NHM	Mining
15	Anglo American Plc	AGL	Mining
16	Impala Platinum Holdings LTD 2	IMP	Mining
1	Sibanye-Stillwater Limited	SSW	Mining
2	Unicorn Capital partners	UCP	Oil & Gas Producers
3	Orion Minerals NL	ORN	Mining
4	Kumba Iron Ore Limited	KIO	Industrial Metals & Mining
5	Exxaro Resources Limited	EXX	Oil & Gas Producers
6	Pan African Resources Plc	PAN	Industrial Metals & Mining
7	Keaton Energy Holdings Limited/Wescoal 3	KEH	Oil & Gas Producers
8	Anglogold Ashanti Limited	ANG	Mining
9	BHP Billiton Plc 2	BIL	Industrial Metals & Mining
10	Kumba Iron Ore 2	KIO	Mining
11	Anglo American Platinum Limited	AMS	Mining
12	Merafe Resources Limited	MRF	Industrial Metals & Mining

ISBN NUMBER: 978-0-620-99843-7

13	Atlatsa Resources Corporation	ATL	Mining
14	African Rainbow Minerals Limited	ARI	Industrial Metals & Mining
	Not Usable Data		
31	Glencore Plc	GLN	Mining
32	Oando Plc	OAO	Oil & Gas Producers
33	Diamondcorp Plc	DMC	Industrial Metals & Mining
34	Petmin LTD	PET	Mining
35	Randgold & Exploration Company Ltd	RNG	Mining
36	Gold Fields Limited 2	GFI	Mining
37	DRDGOLD Limited	DRD	Mining
38	Andulela Investment Holdings Limited	AND	Industrial Metals & Mining
39	Hulamin Limited	HLM	Industrial Metals & Mining
40	Efora energy LTD 2	EEL	Oil & Gas Producers
41	Tharisa Plc	THA	Mining
42	Europa Metals 1	EUZ	Mining
43	Tawana	TAW	Industrial Metals & Mining
44	Jubilee Platinum Plc	JBL	Industrial Metals & Mining
45	Royal Bafokeng Platinum Limited	RBP	Mining
46	Evraz Highveld Steel & Vanadium Ltd 2	EHS	Industrial Metals & Mining
47	ZCI Limited	ZCI	Industrial Metals & Mining
48	Kibo Mining Plc 2	KBO	Mining
49	Vivo Energy Plc	VVO	Oil & Gas Producers
50	African Eagle Resources Plc	AEA	Industrial Metals & Mining
51	Firestone Energy Limited	FSE	Mining
52	South32 Limited	S32	Industrial Metals & Mining
53	Evraz Highveld Steel & Vanadium Ltd 1	EHS	Industrial Metals & Mining
54	Renergen Limited	REN	Oil & Gas
55	Erin Energy Corporation	ERN	Oil & Gas Producers
56	Rockwell Diamonds Incorporated	RDI	Industrial Metals & Mining
57	Giyani Gold Corporation		Industrial Metals & Mining
58	Arcelormittal South Africa Limited	ACL	Industrial Metals & Mining

ISBN NUMBER: 978-0-620-99843-7

59	Kore Potash Plc	KP2	Mining
60	Central Rand Gold Limited	CRD	Mining
61	Gemfields Group Limited	GML	Mining: Platinum and Gems
62	Union Atlantic Minerals Limited	UAT	Industrial Metals & Mining
63	Hwange Colliery Company	HWA	Mining: Coal producer
64	Buffalo Coal Corp	BUC	Mining
65	Trans Hex Group Limited	TSX	Mining
66	Alphamin Resources Corporation 1	APH	Mining: Tin
67	Montauk Renewables	MKR	Oil & Gas Producers
68	Sasol Limited	SOL	Oil & Gas Producers
69	BHP Billiton Plc	BIL	Industrial Metals & Mining
70	Efora Energy Limited 1	EEL	Oil & Gas Producers
71	Anglo American Platinum Limited	AMS	Mining
72	Europa Metals or Ferum Crescent	EUZ	Industrial Metals & Mining
73	Anglogold Ashanti Limited	ANG	Mining
74	MCMining Limited 1	CZA	Oil & Gas Producers
75	Wescoal holdings LTD 1	WSL	Industrial Metals & Mining
76	Gold Fields Limited 1	GFI	Mining
77	Master Drilling Group Ltd	MDI	Industrial Metals & Mining
78	Middle eastern Diamond CO or Sable	N/A	Industrial Metals & Mining
79	BSI Steel Limited	BSS	Industrial Metals & Mining
80	Lonmin	N/A	Mining
81	Delrand	N/A	Mining
82	Sentula Mining	N/A	Oil & Gas Producers
83	Great Basin Gold Limited	GBG	Mining

ISBN NUMBER: 978-0-620-99843-7

Appendix 2: Appointment events

	Gender	Name of successor	Internal or External
1	M	Louis Coetzee	External
2	M	Leapeetswe Molotsane	External
3	M	David Hugh Brown	External
4	M	Namir Waisberg	External
5	M	Charles Walters	External
6	M	Nico Muller	External
7	M	Zhimin Li	External
8	F	Diana Hu	External
9	M	Bongani Nqwababa	External
10	M	Nick van der Hoven	External
11	M	Waheed Sulaiman	External
12	M	Boris Richard Kamstra	External
13	M	Peter Steenkamp	External
14	M	PA Dunne	External
15	M	Mark Cutifani	External
16	M	Terence Phillip Goodlace	External
17	M	Neal Froneman	Internal
18	M	Jacques Badenhorst	Internal
19	M	Erol Smart	Internal
20	M	THEMBA MKHWANAZI	Internal
21	M	Mxolisi Mgojo	Internal
22	M	Cobus Loots	Internal
23	M	Lizwi Mtumtum	Internal
24	M	Srinivasan Venkatakrishnan	Internal
25	M	Sir Andrew Mackenzie	Internal
26	M	Norman Bloe Mbazima	Internal
27	M	Chris Griffith	Internal
28	F	Zanele Matlala	Internal
29	M	Harold Motaung	Internal
30	M	Mike Schmidt	Internal
31	M	Ivan Glasenberg	Internal
32	M	Adewale Tinubu	Internal
33	M	Paul Robert Loudon	Internal
34	M	Jan Du Preez	External
35	M	Marais Steyn	External
36	M	Nick John Holland	Internal
37	M	Niël Pretorius	Internal
38	M	Ashruf Kaka	External
39	M	Richard Jacob	Internal
40	M	Robin Vela	External

ISBN NUMBER: 978-0-620-99843-7

41	M	Phoevos Pouroulis	External
42	M	Robert Hair	Internal
43	M	Lennard Kolff Van Oosterwikj	External
44	M	Leon Coetzer	External
45	M	Stephen Phiri	Internal
46	M	Michael Dennis Garcia	Internal
47	M	Thomas Kamwendo	Internal
48	M	Noel O'Keeffe	External
49	M	Christian Chammas	External
50	M	Nicholas Clark	External
51	M	Stephen W Miller	External
52	M	Graham Kerr	External
53	M	Izak Johannes Burger	External
54	M	Stefano Marani	External
55	M	Sakiru Ayoade	Internal
56	M	Johan Oosthuizen	External
57	M	Robin Birchall	External
58	M	Kobus Venter	External
59	M	Brad sampson	External
60	M	Jia Bang Wang	External
61	M	Sean Gilbertson	Internal
62	M	Theo Botoulas	External
63	M	Charles Zinyemba	Internal
64	F	Emma Oosthuizen	External
65	M	Marco Wentzel	Internal
66	M	Maritz Smith	External
67	M	Sean McClain	Internal
68	M	FLEETWOOD GROBLER	Internal
69	M	Mike Henry	Internal
70	M	Damain Matroos	Internal
71	F	Natascha Viljoen	Internal
72	M	Laurence Read	Internal
73	F	Christine Ramon	Internal
74	M	Sebastiano Randazzo	External
75	M	Muthanyi Ramaite	Internal
76	M	Chris Griffith	External
77	M	Daniël (Danie) Pretorius	Founder
78	M	James Allan	Founder
79	M	William Battershill	Founder
80	No data	No data	No data
81	No data	No data	No data
82	No data	No data	No data
83	No data	No data	No data

ISBN NUMBER: 978-0-620-99843-7

Appendix 3: Occupation and date of appointment

	Name of successor	Former occupation	Occupation	Date of appointment
1	Louis Coetzee	Kataroro Gold Plc May 2017 Chairman	Non-executive	2018-08-03
2	Leapeetswe Molotsane	Telkom CEO 2005	CEO	2018-03-08
3	David Hugh Brown	Coal of Africa Ltd 2014 CEO	CEO	2017-12-08
4	Namir Waisberg	CFO Chrometco September 2016	CFO	2017-08-15
5	Charles Walters	CEO of Invicta (2015)	CEO	2017-07-01
6	Nico Muller	Gold fields VP SA 2014	Top Management	2017-04-01
7	Zhimin Li	Jinchuan Group	Executive	2017-02-15
8	Diana Hu	General Manager Nyrstar 2015	Top Management	2016-07-27
9	Bongani Nqwababa	CFO Sasol Ltd March 2015	CFO	2016-07-01
10	Nick van der Hoven	Bauba Resources Ltd Executive	Executive	2016-05-31
11	Waheed Sulaiman	Executive Director February 2015	Executive	2016-04-01
12	Boris Richard Kamstra	Diamondfields PLC/Interim CEO	Top Management	2016-02-04
13	Peter Steenkamp	ARM Executive ARM Platinum	Executive	2016-01-01
14	PA Dunne	Implats Executive 2010	Executive	2014-03-01
15	Mark Cutifani	Anglogold ASHANTI Moab 2007 CEO	Top Management	2013-04-03
16	Terence Phillip Goodlace	Metorex CEO 2009	CEO	2012/07/01
17	Neal Froneman	Sibanye Gold 2013 Executive	Executive	2017-09-21
18	Jacques Badenhorst	Sentula Mining Interim CEO OCT 2015	CEO	2017-08-01
19	Erol Smart	Orion Gold CEO 2012	CEO	2017-05-23
20	THEMBA MKHWANAZI	Anglo America COAL CEO 2014	CEO	2016-09-01
21	Mxolisi Mgojo	Exxaro General Management 2006	Top Management	2016-04-01
22	Cobus Loots	PAN Director 2009	Executive	2015-03-01
23	Lizwi Mtumtum	Keaton Energy board member 2008	Executive	2013-09-10
24	Srinivasan Venkatakrishnan	Anglo Gold Ashanti CFO 2005	CFO	2013-08-05
25	Sir Andrew Mackenzie	BHP Billiton CEO NON-FERROUS	CEO	2013-05-01
26	Norman Bloe Mbazima	Anglo American PLC Coal CEO	CEO	2012/09/01
27	Chris Griffith	Kumba Iron Ore CEO 2008	Top Management	2012-09-01
28	Zanele Matlala	Non-executive Director Merafe 2005	Non-executive	2012-06-01

ISBN NUMBER: 978-0-620-99843-7

29	Harold Motaung	Executive Director Atlatsa 2004	Executive	2012-05-14
30	Mike Schmidt	Executive Director ARM 2007	Executive	2012-03-01
31	Ivan Glasenberg	Worldwide coal business 1990	Top Management	2002-01-01
32	Adewale Tinubu	CEO Oando	CEO	2005-01-01
33	Paul Robert Loudon	President of Diamond Corp 2001	Executive	2005-03-01
34	Jan Du Preez	Petra Mining CEO 1992	CEO	2006-02-01
35	Marais Steyn	KPMG consultant	Other	2006-12-13
36	Nick John Holland	Gold Fields CFO 2002	CFO	2008-05-01
37	Niël Pretorius	2003 Legal counsel	Other	2009-01-01
38	Ashruf Kaka	Lawyer/Executive (2006)	Executive	2010-02-01
39	Richard Jacob	Hultt Aluminium 1990 Manager	Top Management	2010-07-01
40	Robin Vela	Sacoil Holdings Director 2009	Executive	2010/08/30
41	Phoevos Pouroulis	Chromex Mining 2009 Executive	Executive	2010-10-27
42	Robert Hair	Ferrum Crescent Sect 2007	Other	2011-07-13
43	Lennard Van Oosterwikj	RIO TINTO EXECUTIVE	Executive	2011-10-27
44	Leon Coetzer	MD of smelting January 2010	Top Management	2010-08-01
45	Stephen Phiri	RB PLAT Board mem 2010	Executive	2011-04-01
46	Michael Dennis Garcia	Senior VP Evraz Inc pre-2011	Top Management	2011-05-01
47	Thomas Kamwendo	Chairman 2006 ZCI	Non-executive	2011-11-01
48	Noel O'Keeffe	East African Resources Chairman	Non-executive	2011-11-04
49	Christian Chammas	31 YEARS AT TOTAL	Top Management	2012-01-01
50	Nicholas Clark	Grendahl Investment	Other	2014-05-30
51	Stephen W Miller	Board member June 2013 Firestone	Executive	2014-10-01
52	Graham Kerr	BHP CEO 2011	CEO	2014-10-01
53	Izak Johannes Burger	GBP consulting CEO	CEO	2014-10-01
54	Stefano Marani	Founder of Kigeni holdings	Other	2014-11-20
55	Sakiru Ayoade	Management: Technical 2011	Top Management	2017-05-01
56	Johan Oosthuizen	African Diamonds MD 2010	CEO	2017-07-17
57	Robin Birchall	Chairman Silver Bear 2103	Non-executive	2017-11-28
58	Kobus Venter	Aveng CEO (2014)	CEO	2018-02-01
59	Brad Sampson	Tiger resources 2017 CEO	CEO	2018-04-06

ISBN NUMBER: 978-0-620-99843-7

60	Jia Bang Wang	None	Other	2018-04-23
61	Sean Gilbertson	Gemfields PLC CEO 2009	CEO	2018-07-11
62	Theo Botoulas	Miranda Mineral Holdings 2017	CEO	2017-02-15
63	Charles Zinyemba	Medical services manager 2011	Other	2018-10-05
64	Emma Oosthuizen	Buffalo Corp CFO October 2018	CFO	2019-02-11
65	Marco Wentzel	Chairman of Trans Hex 2017	Non-executive	2019-08-01
66	Maritz Smith	Continental coal CFO 2012	CFO	2019-08-12
67	Sean McClain	2014 as CFO	CFO	2019-09-01
68	FLEETWOOD GROBLER	VP of Sasol Germany 2010	Top Management	2019-11-01
69	Mike Henry	BHP minerals Australia VP (2003)	Top Management	2020-01-01
70	Damain Matroos	2015 Corporate finance	Other	2020-03-02
71	Natascha Viljoen	2014 processing head	Top Management	2020-04-01
72	Laurence Read	Executive (2018) Europa	Executive	2020-08-05
73	Christine Ramon	CFO 2014	CFO	2020-09-01
74	Sebastiano Randazzo	Secretary at Xtv 2014	Other	2021-02-01
75	Muthanyi Ramaite	Board member July 2019	Executive	2021-03-01
76	Chris Griffith	Anglo American CEO (2012)	CEO	2021-04-01
77	Daniël (Danie) Pretorius	Founder	Other	Founder
78	James Allan	Founder	Other	Founder
79	William Battershill	Founder	Other	Founder
80	No data	No data	No data	No data
81	No data	No data	No data	No data
82	No data	No data	No data	No data
83	No data	No data	No data	No data

ISBN NUMBER: 978-0-620-99843-7

Appendix 4: Useable ROA data

No.	Company name	Internal/External CEO	ROA Pre-appointment (%)	ROA Post-appointment (%)
1	Kibo Energy Plc 1	External	-20,11	-14,19
2	Resource Generation Limited	External	-2,61	-6,71
3	MCMining Limited 2	External	-6,72	-12,76
4	Chrometco Limited	External	-8,67	-3,71
5	Assore Limited	External	7,46	18,70
6	Impala Platinum Holdings Limited	External	-2,37	-6,54
7	Wesizwe Platinum Limited	External	-2,04	-0,13
8	Eastern Platinum Limited	External	-21,81	-9,86
9	Sasol Limited 2	External	6,77	1,51
10	Bauba resources	External	-25,71	17,54
11	Wescoal holdings LTD 2	External	4,68	5,76
12	Alphamin Resources Corporation 2	External	-11,64	-1,69
13	Harmony Gold Mining Company	External	-7,42	-5,23
14	Northam Platinum Limited	External	3,18	-4,39
15	Anglo American Plc	External	3,47	-6,595
16	Impala Platinum Holdings LTD 2	External	8,08	-2,33
1	Sibanye-Stillwater Limited	Internal	6,24	-1,52
2	Unicorn Capital partners	Internal	-19,64	2,57
3	Orion Minerals NL	Internal	-51,48	-26,46
4	Kumba Iron Ore Limited	Internal	11,71	17,97
5	Exxaro Resources Limited	Internal	-0,62	10,40
6	Pan African Resources Plc	Internal	15,65	8,38
7	Wescoal 3	Internal	2,92	-8,26
8	Anglogold Ashanti Limited	Internal	11,36	-0,82
9	BHP Billiton Plc 2	Internal	18,97	5,45
10	Kumba Iron Ore 2	Internal	58,71	30,17
11	Anglo American Platinum Limited	Internal	8,33	-0,44
12	Merafe Resources Limited	Internal	5,36	4,32

ISBN NUMBER: 978-0-620-99843-7

13	Atlatsa Resources Corporation	Internal	-6,37	10,92
14	African Rainbow Minerals Limited	Internal	8,92	7,04

ISBN NUMBER: 978-0-620-99843-7

Appendix 5: Tenure of appointments

	Name of successor	Tenure in years	Date of appointment
1	Louis Coetzee	2,91	2018-08-03
2	Leapeetswe Molotsane	3,31	2018-03-08
3	David Hugh Brown	3,15	2017-12-08
4	Namir Waisberg	3,88	2017-08-15
5	Charles Walters	4,00	2017-07-01
6	Nico Muller	4,25	2017-04-01
7	Zhimin Li	2,13	2017-02-15
8	Diana Hu	4,93	2016-07-27
9	Bongani Nqwababa	3,33	2016-07-01
10	Nick van der Hoven	5,09	2016-05-31
11	Waheed Sulaiman	4,92	2016-04-01
12	Boris Richard Kamstra	3,52	2016-02-04
13	Peter Steenkamp	5,50	2016-01-01
14	PA Dunne	7,33	2014-03-01
15	Mark Cutifani	8,24	2013-04-03
16	Terence Phillip Goodlace	1,19	2012/07/01
17	Neal Froneman	3,78	2017-09-21
18	Jacques Badenhorst	3,92	2017-08-01
19	Erol Smart	4,11	2017-05-23
20	Themba Mkhwanzi	4,83	2016-09-01
21	Mxolisi Mgojo	5,25	2016-04-01
22	Cobus Loots	6,33	2015-03-01
23	Lizwi Mtumtum	2,56	2013-09-10
24	Srinivasan Venkatakrishnan	7,91	2013-08-05

ISBN NUMBER: 978-0-620-99843-7

25	Sir Andrew Mackenzie	6,67	2013-05-01
26	Norman Bloe Mbazima	8,83	2012/09/01
27	Chris Griffith	8,83	2012-09-01
28	Zanele Matlala	9,08	2012-06-01
29	Harold Motaung	9,13	2012-05-14
30	Mike Schmidt	9,33	2012-03-01
31	Ivan Glasenberg	19,50	2002-01-01
32	Adewale Tinubu	16,50	2005-01-01
33	Paul Robert Loudon	16,33	2005-03-01
34	Jan Du Preez	15,42	2006-02-01
35	Marais Steyn	14,55	2006-12-13
36	Nick John Holland	12,92	2008-05-01
37	Niël Pretorius	12,50	2009-01-01
38	Ashruf Kaka	11,42	2010-02-01
39	Richard Jacob	11,00	2010-07-01
40	Robin Vela	9,51	2010/08/30
41	Phoevos Pouroulis	10,68	2010-10-27
42	Robert Hair	9,97	2011-07-13
43	Lennard Kolff Van Oosterwikj	9,68	2011-10-27
44	Leon Coetzer	10,92	2010-08-01
45	Stephen Phiri	10,25	2011-04-01
46	Michael Dennis Garcia	10,17	2011-05-01
47	Thomas Kamwendo	9,67	2011-11-01
48	Noel O'Keeffe	6,75	2011-11-04
49	Christian Chammas	9,50	2012-01-01
50	Nicholas Clark	7,09	2014-05-30

ISBN NUMBER: 978-0-620-99843-7

51	Stephen W Miller	6,75	2014-10-01
52	Graham Kerr	6,75	2014-10-01
53	Izak Johannes Burger	6,75	2014-10-01
54	Stefano Marani	6,61	2014-11-20
55	Sakiru Ayoade	4,17	2017-05-01
56	Johan Oosthuizen	3,96	2017-07-17
57	Robin Birchall	3,59	2017-11-28
58	Kobus Venter	3,42	2018-02-01
59	Brad sampson	3,24	2018-04-06
60	Jia Bang Wang	3,19	2018-04-23
61	Sean Gilbertson	2,97	2018-07-11
62	Theo Botoulas	4,38	2017-02-15
63	Charles Zinyemba	2,74	2018-10-05
64	Emma Oosthuizen	2,39	2019-02-11
65	Marco Wentzel	1,92	2019-08-01
66	Maritz Smith	1,89	2019-08-12
67	Sean McClain	1,83	2019-09-01
68	Fleetwood Grobler	1,67	2019-11-01
69	Mike Henry	1,50	2020-01-01
70	Damain Matroos	1,33	2020-03-02
71	Natascha Viljoen	1,25	2020-04-01
72	Laurence Read	0,91	2020-08-05
73	Christine Ramon	0,83	2020-09-01
74	Sebastiano Randazzo	0,42	2021-02-01
75	Muthanyi Ramaite	0,33	2021-03-01
76	Chris Griffith	0,25	2021-04-01

ISBN NUMBER: 978-0-620-99843-7

77	Daniël (Danie) Pretorius	N/A	Founder
78	James Allan	N/A	Founder
79	William Battershill	N/A	Founder
80	No data	N/A	No data
81	No data	N/A	No data
82	No data	N/A	No data
83	No data	N/A	No data

ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Encouraging a Culture of Tax Compliance for South Africans owning and using Crypto Assets

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ABSTRACT

Crypto assets have taken a great prominence in our markets. The uncertainty around crypto regulations has caused a lack of understanding of the tax treatment of crypto assets worldwide. This means that there may be a real risk of tax non-compliance by individuals who own and use crypto assets. The aim of this paper is to compare tax guidance on crypto assets made available by tax administration to taxpayers for a number of countries, including South Africa. The purpose with this comparison is to assess the level of service orientation displayed by SARS as strategy to promote voluntary compliance by taxpayers and from a South African perspective identify shortcomings in the available guidance and support currently offered to users of crypto assets. A qualitative approach was used in this study. Recommendations made by the OECD in the form of general insights that policymakers may wish to consider in the taxation of crypto assets were used to construct a set of criteria as a framework for comparing published tax guidance. Data were searched by accessing the applicable tax administrations' websites and using applicable keywords. The researchers then categorised the data using the framework constructed from the review of the OECD Report to identify similarities and differences in the guidance provided on the tax treatment of crypto assets by the tax administration in the USA, UK, Singapore and South Africa. Findings suggest that the South African tax administration is exhibiting

a service-orientated approach towards taxpayers, but areas for improvement in providing information, support and making it easy to comply, were also identified.

KEYWORDS

Crypto assets; crypto regulation; OECD; service-orientation; tax authority; tax guidance; trust; voluntary tax compliance

INTRODUCTION

Crypto assets[5] were first launched in 2009, with Bitcoin being the first crypto asset (Intergovernmental Fintech Working Group (IFWG), 2021). According to De Best (2022), the number of crypto assets worldwide amounted to 10 397 by February 2022, with the top 20 crypto assets making up 90% of the total market. Statista (2022) shows that in June 2021 there was a total of 221 million crypto asset users worldwide. Spenkelink (2014:8) states that crypto assets may be seen as "a digital medium of exchange that relies on a decentralised network, that facilitates a peer-to-peer exchange of transactions secured by public-key cryptography." Crypto assets could, therefore, be understood to be a digital means of exchanging value through a network.

Owning, exchanging, or using crypto assets generally has tax consequences that could result in tax liabilities. However, many individuals are not aware of, or do not understand these tax consequences. Granwal (2021) identified a lack of understanding of the tax treatment of crypto investments as one of the challenges to investing in Crypto in Australia. A survey among 1 800 Australians, across demographic segments, revealed that 32% of respondents agreed to having a lack of understanding of the tax treatment of crypto assets. This means that there may be a real risk of tax non-compliance by individuals who own and use crypto assets.

This risk has been acknowledged by numerous tax authorities across the globe. This is evident from the Organisation for Economic Co-operation and Development (OECD)

5 The term crypto assets will be used in this paper to include all references to cryptocurrencies, virtual currencies, crypto coins, tokens, digital tokens and digital coins.

ISBN NUMBER: 978-0-620-99843-7

report entitled “Taxing virtual currencies: An Overview of Tax Treatments and Emerging Tax Policy Issues” (OECD, 2020). The report provides a comprehensive analysis of the approaches to taxing virtual assets and identify policy gaps for more than 50 jurisdictions. The OECD acknowledges that crypto-assets pose a number of challenges for tax policy, especially in balancing a number of competing goals and perspectives, and the report concludes by providing general insights for possible consideration by policymakers in the taxation of crypto assets (OECD, 2020).

The OECD (2020) emphasises the importance of certainty, transparency, and support for taxpayers as guidelines to encourage voluntary compliance among taxpayers. These actions could be considered characteristic of a service orientation by a tax authority. Kirchler (2007:204) describes a “service and client approach” by a tax authority as one where regulations are made clear and understandable, procedures are transparent and taxpayers are given support for fulfilling their tax obligations. Taxpayers can also expect to be treated with respect and politeness when the tax authority aims to act from a service orientation. Kirchler (2007:188) further confirms that a service orientation assumes that taxpayers are willing to comply if they “understand tax laws and perceive the law and the procedures of taxpaying to be fair.”

The South African tax authority has made some progress on providing guidance on the tax treatment of crypto assets. National Treasury in a joint initiative with the South African Reserve Bank, the Financial Services Board (now the Financial Sector Conduct Authority), the South African Revenue Service (SARS) and the Financial Intelligence Centre issued an initial public statement alerting the public to the risks of crypto assets in 2014 (National Treasury, 2014). In 2018 SARS released a media statement explaining SARS’s stance on the tax treatment of cryptocurrencies (SARS, 2018) and published some frequently asked questions on their website. The list of frequently asked questions on crypto assets was reviewed in 2021, and is still available on the SARS website (SARS, 2022).

This paper aims to compare the tax guidance on crypto assets made available by tax administrations to taxpayers (as individuals owning and using crypto assets) for a number of countries, including South Africa. The purpose with this comparison is to

ISBN NUMBER: 978-0-620-99843-7

assess the level of service orientation displayed by SARS as strategy to promote voluntary compliance by taxpayers and further to identify shortcomings in the available guidance and support currently offered to users of crypto assets from a South African perspective.

The paper is organised as follows: The section below provides a short background on crypto assets while the section thereafter presents the theoretical lens for the paper by placing the concepts of clarity, fairness and support firmly in the academic literature, showing that these concepts are considered important factors for voluntary compliance. The methodology then follows whereafter the comparative analysis is presented and discussed. The paper finally concludes on the findings and offers suggestions for improvement in guidance made to taxpayers.

BACKGROUND ON CRYPTO ASSETS

Bitcoin was the very first crypto asset (IFWG, 2021), and it was described by the creator, Satoshi Nakamoto (2008) (a pseudonym), as a “Peer-to-Peer Electronic Cash System”. It is a means of exchanging value virtually as opposed to physically that does not require the intervention of any kind of authority from a bank. This lack of intervention from authority can result in issues with taxpayers not declaring profits and losses whilst transacting with crypto assets.

Crypto assets can be used in several ways. This includes buying and selling of crypto assets to generate a profit; payment for goods and services using crypto assets; initial coin offerings (ICOs) where crypto assets are used to start up projects and support services such as digital wallet services; and mining of crypto assets (IFWG, 2021:9-15). One can see that the extent to which crypto assets can be used, and the uncertainty of the taxation implications of the above transactions, could lead to weaknesses in the tax systems.

There is currently no authoritative definition of a crypto asset. Global oversight bodies and regulatory authorities have their own definitions of what constitutes crypto assets. This includes the International Monetary Fund (IMF) that defines crypto assets as

ISBN NUMBER: 978-0-620-99843-7

"digital assets that use cryptography for security and are coins or tokens of distributed ledgers and/or blockchains, including asset-backed tokens" (Cuervo, Morozova, & Sugimoto, 2020:1), the European Banking Authority (EBA) that defines it as follows "Crypto-assets are a type of private asset that depend primarily on cryptography and distributed ledger technology as part of their perceived or inherent value." (European Banking Authority, 2019:4), and the Financial Action Task Force (FATF) "A virtual asset is a digital representation of value that can be digitally traded, or transferred, and can be used for payment or investment purposes" (FATF, 2012-2020:130). The above definitions are in agreement that crypto assets are a type of asset that is traded digitally and has inherent value.

In South Africa, a presentation by the Parliamentary Budget Office notes that "there is an underreporting in relation to cryptocurrency investment and related activities". It further states that a lack of prescribed regulatory environments is a main contributor to these acts of non-compliance (Parliamentary Budget Office, 2021). The OECD (2020:54) finds that the tax challenges arising with the use of crypto assets are due to "the nature of these assets, including their lack of centralised control, (pseudo-) anonymity, valuation difficulties, and hybrid characteristics (i.e. including both aspects of financial instruments and intangible assets)".

ENCOURAGING VOLUNTARY TAX COMPLIANCE

> *Voluntary compliance is by far the most efficient way of achieving a tax administration's compliance goals, and central to this is the provision of a wide range of effective and easy to use taxpayer communication channels, both on a reactive and proactive basis* (OECD, 2021b).

Academic research on the factors influencing tax compliance has been steadily growing in recent decades. Some authors providing comprehensive overviews and synthesis of the tax compliance literature or in some cases meta-analyses of specific tax compliance factors, are Jackson and Milliron (1986); McKerchar (2001); Hofmann, Hoelzl and Kirchler (2008); Kirchler, Muehlbacher, Kastlunger and Wahl (2010);

ISBN NUMBER: 978-0-620-99843-7

Hofmann, Voracek, Bock and Kirchler (2017); Alm (2018) and Yong, Lo, Freudenberg and Sawyer (2019). Understanding taxpayers' compliance decisions and motivations, and factors influencing their compliance behaviours and attitudes, are important elements for tax administrations' strategies for building a culture of voluntary compliance (Kirchler, 2007; OECD, 2017; OECD, 2021a). However, the present paper does not aim to debate the different theoretical approaches to explaining tax compliance behaviour or investigate the factors influencing individuals' tax compliance decisions. The focus with this paper is on investigating tax administrations' service-orientated strategies in building a culture of voluntary compliance in crypto asset users. The theoretical lens applied in this paper lies firmly in the assumption that a service-oriented strategy by a tax administration builds trust between taxpayer and tax authorities which in turn fosters voluntary compliance. In the paragraphs below, the literature supporting this assumption is reviewed.

One of the basic strategic objectives of a modern tax administration is to raise the levels of voluntary compliance by taxpayers (Collosa, 2017; OECD, 2021a; SARS, 2020). In this regard, SARS (2020:8) states in its Strategic Plan "Our aim is to engage with society in a way that earns public confidence and trust, while fostering a willingness to fulfill its obligations". SARS (2020:8) further describes voluntary compliance as taxpayers "fulfilling their obligations with minimal prompting by SARS". SARS (2020) acknowledges the importance of the elements listed below in Table 1 as preconditions for achieving voluntary compliance. Tied to each element is the implication for tax administrations' strategies and action plans to facilitate the desirable outcome.

Table 1: Pre-conditions for voluntary tax compliance from the tax administration's perspective

Taxpayer's expectations	Tax administration's strategic plan	Tax administration's action plans
Taxpayers being aware of their tax obligation	Clarity and certainty of tax rules and processes	• Providing easy to understand and easy to access clarity and guidance

ISBN NUMBER: 978-0-620-99843-7

		• Educate taxpayers about their rights and obligations
It should be easy and less costly to meet tax obligations	Easily accessible, professional and efficient service by the tax administration.	• Providing equitable access to service channels • Service offerings attuned to the needs and behaviours of groups of taxpayers
Recognising the possibility of detection and of consequences for those who do not comply with their obligations	Detecting and penalising non-compliance	• Monitoring of taxpayers and communication when non-compliance is detected • Applying appropriate tools to respond to non-compliance not corrected by taxpayers

Source: Authors' own compilation based on SARS (2020:8,9)

This approach by SARS as shown in Table 1, is typical of a service-orientated strategy. According to Bornman (2015:170), three types of strategies could be employed by tax administrations to encourage voluntary tax compliance. These are: "norm-orientated" strategies, "service-orientated" strategies and "power-orientated" strategies. Norm-orientated strategies appeal to the intrinsic beliefs of taxpayers by aiming to reinforce tax compliance as the right thing to do or the ethical form of behaviour (Alm & Torgler, 2011). Service-orientated strategies are characterised by efforts of the tax administration to support taxpayers, providing clear and understandable regulations and having a kinder attitude towards taxpayers (Alm, 2018; Alm & Torgler, 2011; Kirchler, 2007). Power-orientated strategies, refers to powers of credible enforcement as well as effective communication of these powers by tax administrations (Bornman, 2015). These powers need not to be aimed at creating a culture of fear among taxpayers. Leonardo and Martinez-Vazquez (2016) advocate that individuals assess government legitimacy, and accordingly decide whether to trust government, based on the way government agencies exercise their power.

In the introduction section to this paper, it was stated that the OECD (2020) emphasises the importance of certainty, transparency, and support for taxpayers to encourage voluntary compliance among taxpayers. These concepts of certainty,

ISBN NUMBER: 978-0-620-99843-7

transparency and support, are aspects to consider when assessing the level of service-orientation of an institution.

Certainty implies that taxpayers understand how and when crypto assets will be taxed and how to declare their transactions involving crypto assets. This means tax administrations should provide clear guidance to taxpayers. Academic literature on voluntary compliance confirms taxpayers' knowledge and understanding of their tax responsibilities as a factor influencing tax compliance (see for example Niemirowski, Baldwin & Wearing, 2003; OECD, 2021a; Saad, 2014). Certainty, for the purpose of this paper, is thus equated to clarity of guidance on the tax treatment of crypto asssets provided to taxpayers.

Transparency, in the context of a tax authority, implies that taxpayers are made aware of the rationale behind a tax treatment and could therefore judge the fairness of the tax treatment (Kirchler, 2007). Support refers to measures implemented by tax administrations to improve taxpayer interaction with tax authorities and make it easier for taxpayers to comply.

Hofmann *et al*. (2008) emphasise the importance of a service-orientated approach in building mutual trust between taxpayer and tax administration. Taxpayers' trust in tax authorities has proved to be essential in creating a culture of voluntary tax compliance (Goslinga, Van der Hel, Mascini & Van Steenbergen, 2018; Kirchler, Hoelzl & Wahl, 2008; Leonardo & Martinez-Vazquez, 2016).

The positive relationship between trust in tax authorities and voluntary tax compliance has been confirmed by a number of empirical studies. Since the introduction of the slippery slope framework of tax compliance by Kirchler *et al*. (2008), which suggests that the power of authorities and trust in authorities shape the tax climate within a country, numerous survey studies and experiments have confirmed these propositions. Scholars testing the assumptions of the slippery slope framework and specifically finding that trust enhances voluntary compliance are, among others, Wahl, Kastlunger and Kirchler (2010); Muelbacher, Kirchler and Schwarzenberger (2011);

ISBN NUMBER: 978-0-620-99843-7

Benk and Budak (2012); Batrancea and Nichita, (2013); Kochler, Batrancea, Nichita, Pantya, Belianin and Kirchler (2013) and Kogler, Muehlbacher and Kirchler (2015).

Gangl, Hofmann and Kirchler (2015) further differentiate between qualities of trust, namely reason-based trust and implicit trust. Reason-based trust is defined as "the deliberate decision to trust tax authorities based on their perceived goals; their perceived competence, motivation, and benevolence; and perceived supportive external circumstances" (Gangl, Hofmann, Hartl & Berkics, 2020:101). Implicit trust in tax authorities happens more automatically and may be based on repeated positive interactions with the tax authority (Gangl *et al*., 2015) or simply experiencing warmth as opposed to hostility in communications from tax authorities (Williams & Bargh, 2008 as cited by Gangl *et al*., 2015). Gangl *et al*. (2015) conclude that accumulated reason-based trust eventually becomes implicit trust.

Reason-based trust and a service-orientated approach by tax administrations go hand-in-hand and fosters a culture of voluntary tax compliance (Gangl *et al.*, 2015; Leonardo & Martinez-Vazquez, 2016). In an attempt to identify actions governments could take that may affect individual trust, Leonardo and Martinez-Vazquez (2016) note that applying clear and fair procedures to all taxpayers and providing support and making it easy for taxpayers to fulfill their tax obligations are important elements for building trust between taxpayers and the tax authority. This view is also supported by Murphy (2002); Braithwaite (2002); OECD (2010); Muehlbacher and Kirchler (2010); Gangl *et al*. (2015); Migues (2018); Goslinga *et al*. (2018); OECD (2020) and OECD (2021b).

Having established the principles and support for the basis of investigation into publications of tax guidance on crypto assets available to taxpayers, the attention now turns to the OECD report entitled "Taxing Virtual Currencies: An Overview Of Tax Treatments And Emerging Tax Policy Issues" (hereafter referred to as the OECD report) (OECD, 2020). The OECD Report provides a comprehensive analysis of the tax treatments globally of virtual currencies and concludes its findings by suggesting guidelines for strengthening regulatory frameworks for the taxation of virtual

ISBN NUMBER: 978-0-620-99843-7

currencies. Notably, these guidelines as summarised in Table 2 below, are resonant of the “service-orientation” as discussed in this paper.

Table 2: Summary of guidelines by tax administrations to strengthening regulatory frameworks for taxation of virtual currencies

Guideline	Key element of service orientation
1. Ensure that there is clear guidance and a clear legislative framework.	Clarity
2. Guidance should be comprehensive and address the major taxable events and income forms associated with crypto assets.	Clarity
3. Communicate the rationale behind the adopted tax treatment.	Clarity/fairness
4. Review and adapt guidance frequently.	Support
5. Consider measures to support improved compliance.	Support
6. Provision made for simplified tax treatment for occasional or small traders.	Making it easy to comply

Source: Authors’ own summary based on OECD (2020)

The present paper reviews available guidance and support measures introduced for users of crypto assets as found on the respective websites of a number of tax administrations. Evaluating published guides, brochures, Frequently Asked Questions (FAQs) and other information posted on tax administrations’ websites, leads to an appreciation of aspects of the level of service orientation exhibited by these tax administrations. In addition, shortcomings and areas for improvement in the South African guidance and support can be identified and suggestions for enhancement can be offered.

RESEARCH METHODOLOGY

A qualitative approach was used in this study. Only documentary text data was analysed and reported on in a descriptive manner. The paradigm associated with the research conducted in this study is interpretivism. Interpretivism takes the view that there is no single, observable reality, but rather reality is ‘constructed’ by the interpretation of it by different subjects (Tisdell & Merriam, 2016). In this study the uncertainties and the viewpoints in the taxation of crypto assets of four countries, United States of America (USA),United Kingdom (UK), Singapore and South Africa is

ISBN NUMBER: 978-0-620-99843-7

described, to construct the reality within which cryptocurrency is operating from a tax perspective.

USA, UK and Singapore were selected for this study for the following reasons:

- The USA: the USA is one of the largest economies in the world and regarded as a “global advocate” for crypto assets (Reuters, 2017b).
- The UK: the UK is a major trading partner for many countries in the world and is also regarded as a “global advocate” for crypto assets (Reuters, 2017b).
- Singapore: Singapore has positioned itself as a promoter of crypto assets, with the government offering favourable tax treatments and public funding for blockchain projects (Pawczuk, Massey & Holdowsky, 2019).
- South Africa: South Africa is included as the country to which the other three are to be compared.

The recommendations stemming from the OECD Report were used to construct a set of criteria as a framework with respect to strengthening the regulatory frameworks of the taxation of crypto assets (see Table 2). Data were searched by accessing the applicable tax administrations’ websites and using keywords such as “crypto”, “virtual currency” and “digital currency”. Data were thus retrieved in the form of guidelines provided and Frequently Asked Questions (FAQs) on tax authorities’ websites and applicable documents on tax treatment of crypto assets published by the tax administrations in the USA, UK, Singapore and South Africa. Only guidance relating to income tax were considered in the review. The researchers then categorised the data using the framework constructed from the review of the OECD Report to identify similarities and differences in the guidance provided on the tax treatment of crypto assets by the tax administration in the USA, UK, Singapore and South Africa. Interpreting the results enabled the researchers to assess the quality and quantity of the guidance and support and consequently to conclude on the level of service orientation exhibited by the tax administrations.

ISBN NUMBER: 978-0-620-99843-7

RESULTS AND DISCUSSION

The six guidelines suggested by the OECD, listed in Table 2, forms the framework for the review the tax guidance on crypto assets for the selected countries. The first three tables (Tables 3 – 5) presented below focus on the quality (clarity and fairness) of guidance provided (guidelines 1 to 3), in other words, if tax implications of using crypto assets are clearly communicated and if such treatment appears to be fair and the rationale of it is explained clearly. Table 6 and 7 focus on "support" and considers the frequency of updating guidance by tax administrations and searches for any measures of support (other than published guides) to taxpayers implemented by tax administrations (guidelines 4 and 5). The last guideline (guideline 6), "making it easy to comply" considers if the tax administration implemented any special rules to simplify individual taxpayers' tax obligations with regards to owning or using crypto assets.

Guideline 1: Ensure that there is clear guidance and a clear legislative framework

Table 3 below provides an overview of the type of information on the tax treatment of crypto assets available on the websites of the four tax administrations.

Table 3: Available guidance on tax treatment of crypto assets for the USA, UK, Singapore and South Africa

USA	The website of the Internal Revenue Service (IRS) has a page dedicated to "Virtual Currency" (IRS, 2021c). In addition to this, the IRS has issued two documents to the public in relation to virtual currency. The first was Notice 2014-21 (IRS, 2014), issued on 14 April 2014 and the second was Revenue Ruling 2019-24 (IRS, 2019a) issued on 9 October 2019. There is also a webpage of Frequently Asked Questions (FAQs), where taxpayers can refer for more guidance on specific areas of uncertainty (IRS, 2021a).
UK	HM Revenue and Customs (HMRC) has released a lengthy manual (HMRC, 2021b) to help taxpayers understand the tax implications that can arise from cryptoasset transactions. The manual is intended for use by HMRC staff but gives taxpayers a glimpse into how HMRC would treat cryptoasset transactions. The manual comprises of an introductory section, a section relating to individuals, a section relating to businesses and lastly, a section dedicated to compliance. The manual has an online search function using keywords and appears to be comprehensive and easy to use and understand.

ISBN NUMBER: 978-0-620-99843-7

Singapore	The Inland Revenue Authority of Singapore (IRAS) issued a guide in 2020 on the "Income Tax Treatment of Digital Tokens" (IRAS, 2020). The guide is organised into two parts. Part A discusses the tax treatment for digital tokens, while Part B explains the tax treatment for Initial Coin Offerings. It appears that no other guidance or FAQs is provided on the IRS website.
South Africa	Since 30 August 2021, there is a webpage on SARS (2021) website dedicated to "Crypto Assets & Tax". The webpage lays out useful information in terms of how SARS views, treats and traces cryptocurrency and cryptocurrency transactions. There is also a brief history of how SARS has got to this stage with respect to its treatment of cryptocurrency: • In a media statement, the SARS (2018) stated that they would treat cryptocurrency transactions in accordance with normal income tax rules. • Later in 2018, SARS released responses to a set of FAQs (SARS, 2019) on cryptocurrency, which was reviewed on 23 June 2021.

Source: Authors' own compilation. Sources used are reflected in the table and appear in the reference list.

From the summaries made in Table 3 above, it is clear that all the tax administrations issued special guidance to taxpayers on how crypto assets are to be treated for income tax purposes. Some guidance are written in a more formal and almost technical language (e.g. Singapore), while others are written in a manner which is easier to understand by the average taxpayer. The researchers are of the opinion that FAQs provide more direct answers to questions than having to search through a manual to find answers to possible questions. The search option in the HMRC manual is very useful and easy to use and countries having dedicated webpages on the tax administrations' website makes finding the information easier and simpler to find what you need in a quick glance. The experience that you can easily find and understand information are likely indicators of a service-oriented approach by the tax authority.

ISBN NUMBER: 978-0-620-99843-7

Guideline 2: Guidance should be comprehensive and address the major taxable events and income forms associated with crypto assets.

Major taxable events in the crypto asset environment are considered to be creation of virtual assets (via mining/forging, initial offerings and airdrops) and related expenses; speculation with or investment in crypto assets, exchanges with other virtual currencies, fiat currency, and for goods and services (including valuation); losses or theft; and other emerging developments (e.g. hard forks, stablecoins) (OECD, 2020). Table 4 aims to provide a comprehensive overview of the guidance given by the tax administrations, however, all the detail could not possibly be summarised. Since it is also not the aim of this paper to improve the readers' understanding of how these events are taxed, the table serves mainly to show that some administrations have covered some events in much detail while, especially in the case of South Africa, there are a clear lack of guidance on the more complex taxable crypto events. Table 4 summarises the guidance given by each country's tax administration on the following events: mining receipts; mining expenses; airdrops and hard forks; losses; and valuation of crypto assets. Disposal of crypto assets are not dealt with as an event on its own but mention to it is made under other events, with reference to it being part of a trade or held for investment purposes.

Table 4: Tax treatment of taxable events for crypto assets in USA, UK, Singapore and South Africa

	USA	UK	Singapore
Mining receipts	Taxable on receipt The fair market value must be included in a taxpayer's gross income for tax purposes (IRS, 2021a).	Taxable on receipt. If the mining activity does not constitute a trade, then the British pound sterling (GBP) value of the tokens received is taxable as miscellaneous income. If the taxpayer holds on to the tokens and disposes of them at a later stage, the disposal	Taxable only on disposal (not on receipt). Taxability of a miner's profits from the disposal of cryptocurrency depends on intention. If mining is performed as a hobby disposal gains/losses of the payment tokens are not taxable/deductible (IRAS, 2020:10-11).

ISBN NUMBER: 978-0-620-99843-7

	USA	UK	Singapore
		may be subject to Capital Gains Tax (HMRC, 2021b).	Individual engaging in mining activities is considered as a hobby. Gains from sale of the mined payment tokens are treated as capital gains and are not taxable (IRAS, 2020:10-11).
Mining expenses	If the mining activity constitutes a trade or a business, mining expenses are deductible (IRS, 2021a).	May be deducted against profits for income tax or corporation tax purposes (if carrying on a trade) or miscellaneous income (if not trading) (HMRC, 2021b).	Deducted if the taxpayer is regarded as carrying on the business of mining. In the case of an individual, mining expenses will not be deductible unless the individual shows "a habitual and systematic effort to make a profit from the activities" (IRAS, 2020:11).
Airdrops and hard forks	Taxable on receipt. Gross income if the taxpayer has received new tokens and has dominion and control over those new tokens at the fair market value (IRS, 2019a).	Cryptocurrency received through an airdrop is only taxable if received in exchange for goods or services and cryptocurrency received through a hard fork[6] is not taxable. Cost should be split between the original token and the new token. Airdropped tokens may be subject to Capital Gains Tax when they are disposed of at a later stage (HMRC, 2021g).	Only taxable if received in exchange for goods or services. A receipt of cryptocurrency through a hard fork, could be seen as a windfall for the recipient as she/he received the additional token without doing anything in return. A windfall would not be regarded as income and it is, therefore, not taxable on receipt (IRAS, 2020:12). Gains from the subsequent disposal of the tokens, including tokens received through hard

6 A hard fork is a major change in a blockchain's protocol that rewrites fundamental information and makes previously invalid information valid (Daniels, 2018).

ISBN NUMBER: 978-0-620-99843-7

	USA	UK	Singapore
			fork or through airdrop are taxable (IRAS, 2020:12).
Losses	Not specifically dealt with.	Losses from trade may be set-off against other income or future profits or carried forward. Losses due to loss of a private key or fraud may be considered as a 'negligible value claim'. If the profits from cryptocurrency transactions are taxable as miscellaneous income, the losses may be able to be carried forward to later years (HMRC, 2021h).	Losses on disposal may be deducted if the taxpayer is engaged in trade. Losses due to theft/fraud are not dealt with (no guidance provided) (IRAS, 2020).
Valuation	The fair market value of the token at the time of receipt or fair market value of the property received in exchange (IRS, 2021a).	The GBP value determined using an appropriate valuation methodology and/or exchange rate. The value of any gain or loss should be converted into GBP for tax purposes. If there is no GBP value an appropriate exchange rate must be established in order to convert the transaction to GBP (HMRC, 2021m).	A taxpayer must apply an exchange rate that best represents the value of the token. IRAS does not prescribe any methodology to value cryptocurrency Exchange rate used must best reflect the value of the tokens, provided that the exchange rate is reasonable and verifiable and where the exchange rate is not available on an exchange, taxpayers may use other means to support their claim that the basis of the exchange rate used is reasonable. The methodology used to determine the exchange rate should be consistently applied year on year (IRAS, 2020:3-4).

ISBN NUMBER: 978-0-620-99843-7

	USA	UK	Singapore
SOUTH AFRICA			
Mining receipts	Taxable on receipt. Successful mining gives rise to an immediate accrual or receipt of cryptocurrency. The newly acquired cryptocurrency is held as trading stock until it is sold or exchanged in a cash or barter transaction (SARS, 2018).		
Mining expenses	May be deductible if it is incurred in the production of income (SARS, 2019).		
	SOUTH AFRICA		
Airdrops and hard forks	Not dealt with.		
Losses	Not dealt with.		
Valuation	Not dealt with in detail. The following question and answer are contained in the FAQ document (SARS, 2019): "Q4. Should a taxpayer who receives cryptocurrency as payment for goods or services include, in computing gross income, the fair market value of the cryptocurrency? Answer: Yes, such income is subject to normal tax." Another reference to valuation is made on the SARS media statement as follows: (iii) Goods or services can be exchanged for cryptocurrencies. This transaction is regarded as a barter transaction. Therefore the normal barter transaction rules apply (SARS, 2018).		

Source: Authors' own compilation. Sources used are reflected in the table and appears in the reference list.

It appears that the UK and Singapore provide more detail and explain in more clear terms what the tax treatment would be in the case of certain crypto events. The UK manual also makes searching for this guidance easy with its searchable online manual. Taxpayers can use a keyword, e.g. "loss" and the manual will display all information related to that, with links to other sections in the manual. South Africa notably lags behind, with little to no guidance provided on some of the crypto events.

ISBN NUMBER: 978-0-620-99843-7

Guideline 3: Communicate the rationale behind the adopted tax treatment

Table 5 summarises how each country communicates how crypto assets fit into the legislative framework and to what extent the rationale behind its tax treatment is communicated. Understanding the rationale behind tax treatments has been shown to improve perceptions of fairness by taxpayers (Feld & Frey, 2007).

Table 5: The rationale behind the tax treatment in USA, UK, Singapore and South Africa

USA	Terminology used: Virtual currency and cryptocurrency IRS regards crypto assets as property and that general tax principles apply (IRS, 2021a). On the Virtual Currency webpage, the IRS explains that virtual currency is not legal tender in the USA, therefore, it cannot be treated as currency (IRS, 2021c).
UK	**Terminology used:** Cryptoasset No special tax regime applies to crypto assets, the existing Income Tax, Corporation Tax and Capital Gains Tax rules apply to cryptoasset transactions. Within the Cryptoasset Manual (HMRC, 2021b), HMRC explains that it does not consider crypto assets to be currency or money. The manual also contains important concepts related to crypto assets, for example Distributed Ledger Technology and wallets (HMRC, 2021c). HMRC also explains which taxes apply and why (HMRC, 2021f).
Singapore	**Terminology used:** Digital token Singapore does not have a special tax regime that applies to crypto assets – the existing income tax principles apply. The guide contains the following explanation with respect to the income tax treatment of cryptocurrency: "While a payment token serves as a mode of payment, it is not a fiat currency as it is not issued by any government and is not legal tender. For income tax purpose, IRAS views a payment token as an intangible property as it usually represents a set of rights and obligations and does not have a physical form. Hence, transactions involving the use of payment tokens as payment for goods or services are viewed as barter trade and the value of goods or services transferred should be determined at the point of transaction." (IRAS, 2020:3)
South Africa	**Terminology used:** Crypto asset SARS has defined crypto assets on its webpage as follows: Cryptocurrency is regarded as an intangible asset (SARS, 2018). In 2018, following the media statement, there was a legislative amendment to include 'cryptocurrency' within the definition of a financial instrument in section 1 of the ITA In 2020, another legislative amendment was made to update the terminology in the ITA to refer to the wider term of crypto assets rather than cryptocurrency (National Assembly, 2020).

ISBN NUMBER: 978-0-620-99843-7

	SARS explains in the media statement (SARS, 2018) that the existing tax framework should be applied to cryptocurrency transactions, rendering a more comprehensive Interpretation Note unnecessary for now. SARS (2018) also states that specific guidance in the form of a Binding Private Ruling can be applied for should further guidance be necessary.

Source: Authors' own compilation. Sources used are reflected in the table and appears in the reference list.

It is clear from Table 5 that all 4 countries incorporates the tax treatment of crypto assets into its existing tax rules, regarding it as an asset. Understanding the concept that a crypto asset is still an asset and selling it may result in a taxable gain, improves perceptions of fairness and clarity by taxpayers. However, the UK provides much more detail for individual transactions and provides easy navigation to the income tax rules and even directs readers to explanatory notes to help them understand why certain rules apply. Contrary to this, South Africa's guidance do little to help taxpayers understand the rationale behind the tax treatment.

Guideline 4: Review and adapt guidance frequently

The tax administrations' websites and guidance published were scrutinised to establish if they are frequently reviewed and updated. Table 6 below presents the results.

Table 6: Review and update of guidance in USA, UK, Singapore and South Africa

USA	The virtual currency webpage was last reviewed on 30 April 2021 (IRS, 2021c) and the FAQs were last updated on 4 June 2021 (IRS, 2021a)
UK	The manual was developed from guidance content that was first published by HMRC on 19 December 2018 (HMRC, 2021a). The manual itself was first published on 30 March 2021 and last updated on 8 April 2021 (HMRC, 2021b). HMRC acknowledges that the manual is not comprehensive due to the rapidly evolving environment surrounding crypto assets. HMRC intends that the manual will be updated and supplemented as views evolve.
Singapore	The guide was first published on 17 April 2020 and then revised on 9 October 2020 (IRAS, 2020).
South Africa	The first media release was made in 2018 (SARS, 2018) and updated on 30 August 2021 by publishing of a new webpage on SARS website (SARS, 2021). Additionally, the FAQs were reviewed on 23 June 2021, but no updates were made to the contents (SARS, 2019; SARS, 2022).

Source: Authors' own compilation. Sources used are reflected in the table and appears in the reference list.

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From Table 6 it appears that the USA, UK and South Africa are regularly reviewing their guidance, even if no updates are made. This should improve reason-based trust in the tax authority by taxpayers – when perceiving tax authorities as competent and knowledgeable on the evolving crypto asset environment. Singapore appears to have published a revised manual once after the original one, but it cannot be established from visiting the IRAS website if any frequent reviews are being conducted.

Guideline 5: Consider measures to support improved compliance

All the guidance, manuals and websites of the four tax administrations were searched for establishing the extent of help provided to taxpayers with regards to how crypto asset events should be disclosed, what records are to be kept and what to do when having a pool of crypto assets with different dates for purchasing and selling individual assets. Table 7 summarises the guidance provided.

Table 7: Support provided for compliance in USA, UK, Singapore and South Africa

USA	
Disclosure/ Reporting	Questions 42, 43 and 44 of the FAQs provides information on the various forms that could be applicable for reporting cryptocurrency transactions (IRS, 2021a). In 2018, the IRS announced the launch of a Virtual Currency Compliance campaign to "address noncompliance related to the use of virtual currency through multiple treatment streams including outreach and examinations." (IRS, 2021b). The campaign kicked off in 2019.
Record-keeping	The IRS has not provided specific rules laying out the records to be kept. (IRS, 2021a). Guidance is only given in the FAQs on the IRS Website. Question 40 of the FAQs (IRS, 2021a) deals with the documentation to be maintained with respect to specific units of cryptocurrency, which must include the specific unit's unique digital identifier such as a private key, public key, and address, or records showing the transaction information for all units of a specific cryptocurrency that are held in a single account, wallet, or address. The documentation must include: i. the date and time each unit was acquired ii. the basis and the fair market value of each unit at the time it was acquired iii. the date and time each unit was sold, exchanged, or otherwise disposed of iv. the fair market value of each unit when sold, exchanged, or disposed of, and the amount of money or the value of property received for each unit.

ISBN NUMBER: 978-0-620-99843-7

Treatment of identical tokens	If the taxpayer does not keep records to identify specific units of cryptocurrency, then the units are deemed to have been sold, exchanged, or otherwise disposed of on a first in, first out (FIFO) basis.
UK	
Disclosure/ Reporting	HMRC has provided separate and summarised guidance to help taxpayers check if they need to pay tax when they sell or receive cryptocurrency (HMRC, 2018). In general, companies need to report taxable crypto asset transactions as part of their annual company tax return, while individuals need to complete a self-assessment tax return, unless they've received: • crypto assets worth less than £1,000 • less than £2,500 from other untaxed income (HMRC, 2018).
Record-keeping	The onus is on the taxpayer to keep records which must include the following information: The type of crypto assets, date of the transaction, if they were bought or sold, number of units, value of the transaction in GBP as at the date of the transaction), cumulative total of the investment units held, bank statements and wallet addresses, in case these are needed for an enquiry or review (HMRC, 2021e).
Treatment of identical tokens	'Individuals must keep a record of the amount spent on each type of token, as well as the pooled allowable cost of each pool (HMRC, 2021i).
Singapore	
Disclosure/ Reporting	IRAS e-Tax Guide (IRAS, 2020) does not contain specific information on how cryptocurrency transactions are to be disclosed to the IRAS.
Record-keeping	Taxpayers must keep proper records and provide them to the IRAS on request. The records should contain the following information: The date of the transaction, number of units received or sold, value at the time of the transaction, exchange rate used, purpose of the transaction, details of customers/suppliers (for buy-sell transactions, details of the ICO and receipts/invoices of business expenses (IRAS, 2020:7).
Treatment of identical tokens	IRAS (2020:4) states that it will accept the first in, first out (FIFO) or weighted average cost methods of valuing the payment token disposed, which is aligned with the Financial Reporting Standard for Inventories (FRS 2)/Singapore Reporting Standards (International) for Inventories (SFRS (I) 1-2).
South Africa	
Disclosure/ Reporting	In the media release, SARS (2018) stated that the onus is on the taxpayer to report all crypto assets transactions. The webpage contains screenshots showing where

ISBN NUMBER: 978-0-620-99843-7

	cryptocurrency transactions can be disclosed on the current income tax return (SARS, 2021).
Record-keeping	No specific recordkeeping requirements have been prescribed. In response to question 8 of the FAQs, SARS (2019) states that conventional receipts and invoices suffice as proof of purchase and sale price.
Treatment of identical tokens	The following question and answer are included in the FAQs (SARS, 2019): "Q9. Can the purchase price be either the price paid on date of purchase or as with shares the average of the year? Answer: The purchase price is determined on the date of the earlier of receipt and accrual. Cryptocurrency is not regarded as a share and therefore SARS does not treat it as the average for the year."

Source: Authors' own compilation. Sources used are reflected in the table and appears in the reference list.

Table 7 provides evidence that the four tax administrations provides support in the form of detailed guidelines for practical problems. The topics addressed are typical questions that taxpayers trading in crypto assets may ask tax officials and finding answers easy online may leave taxpayers feeling satisfied with their interaction with the tax administration. Especially the UK with its interactive manual makes searching for answers much easier and the US guidance appears to cover more common practical questions that taxpayers could typically ask. South Africa's FAQs appear to be very brief and in some cases may leave a taxpayer frustrated not knowing where to turn next to find more information.

Guideline 6: Provision made for simplified tax treatment for occasional or small traders

Reviewing all the available manuals and guidance, it appears that only the UK makes provision for occasional or small traders. This provision only applies to individuals where:

- the individual receives cryptocurrency worth less than £1,000
- the individual has less than £2,500 from other untaxed income.

In this case, no taxes are due, and no self-assessment return needs to be submitted (HMRC, 2018).

Summary of findings

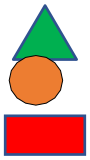
The six guidelines for strengthening regulatory frameworks for the taxation of crypto assets as proposed by the OECD Report (OECD, 2020) have been used to investigate the extent

ISBN NUMBER: 978-0-620-99843-7

to which the four countries' tax administrations have implemented these guidelines. Our results show that countries generally aims to provide clear and sufficient guidance, and to provide support by pre-empting questions and problems taxpayers may experience. However, little has been done in terms of "making it easy" by introducing thresholds or simplified tax rules. Table 8 provides our interpretation of the extent to which each country achieved implementing these guidelines.

The symbols as explained below indicates whether a guideline has been addressed, partially addresses or not addressed.

Legend



= Addressed

= Partially addressed

= Not addressed

Table 8: Summary of ratings per country

Guideline	USA	UK	Singapore	South Africa
1. Ensure that there is clear guidance and a clear legislative framework.	▲	▲	▲	▲
2. Guidance should be comprehensive and address the major taxable events and income forms associated with crypto assets.	●	▲	●	●
3. Communicate the rationale behind the adopted tax treatment.	▲	▲	▲	●
4. Review and adapt guidance frequently.	▲	▲	●	●
5. Consider measures to support improved compliance.	▲	▲	●	●
6. Provision made for simplified tax treatment for occasional or small traders.	■	●	■	■

ISBN NUMBER: 978-0-620-99843-7

Overall, one could conclude that the UK is leading with the most comprehensive guidance, while additional guidance may be required by the USA and Singapore. South Africa too, has made some progress but needs to work on providing more comprehensive guidance on the tax treatment of crypto assets. With regards to clarity of guidance provided, South Africa appears to lag behind some of its peers as much of the guidance available to South African taxpayers are too brief and too non-specific. It also lacks examples to illustrate the tax effects of crypto asset events and in many cases fails to explain an event beyond stating the apparent answer to a question posted. On being transparent, more can be done to explain the rationale behind the tax treatment for all types of crypto tax events. Using examples to explain crypto events and then pointing out the rationale for taxing it, may increase perceptions of fairness by taxpayers. The third aspect of displaying a service orientation, supporting taxpayers, may be the aspect where South Africa lags behind the most. A considerable effort is necessary to identify ways to assist taxpayers in making it easier to comply when tax liabilities arise from events involving crypto assets. The UK's provision for occasional or small traders in crypto assets, is one such example of simplifying matters for taxpayers.

CONCLUSION

The paper reviewed tax administrations' websites for four countries, searching for guidance published on crypto assets and reviewing guidance found in order to conclude on the level of service-orientation exhibited by these tax administrations.

SARS' strategic plan for 2020 – 2024 exemplifies a service-orientation in its aims to encourage voluntary tax compliance, as was illustrated in Table 1. A service-orientation is characterised by efforts to support taxpayers and by providing clear and understandable regulations. Such an orientation seeks to build trust between taxpayer and tax authority, thereby encouraging voluntary compliance.

The tax treatment of crypto assets is still in its infancy and provides an ideal opportunity for tax administrations to build trust within by the taxpayer community by showing competence, care and support. The results from the review of all the available guidance showed that the tax administrations under review have to an extent applied the guidelines offered in the

ISBN NUMBER: 978-0-620-99843-7

OECD report to strengthen their regulatory frameworks for the tax treatment of crypto assets.

In providing clear and comprehensive guidelines on how crypto events are taxed, certainty is created for taxpayers. When taxpayers are made aware of the rationale of why crypto assets are taxed, fairness perceptions may improve, which in turn is essential for trust. SARS made limited guidance available, and in comparison, with especially the UK, there are some gaps in the scope of information as not all taxable events are addressed in the South African guidance.

SARS' service-orientation is less apparent when considering the way it provides support to taxpayers seeking help with regards to their crypto asset disclosures. Although SARS reviewed and updated publications since first published and created FAQs and guidance on its website, more support can be provided with regards to explaining what records to keep and how to disclose transactions.

"Making it easy to comply" is an important approach for a service-orientated tax administration. Simplified regulations, thresholds, and easy accessible channels of communication are just some of the ways to simplify the process of compliance. Only the UK appears to have implemented some form of tax threshold for crypto asset users. South Africa can still consider implementing similar thresholds which will exclude smaller crypto traders from being liable to declare their crypto assets and thus ease compliance.

Limitations and suggestion for further research

The paper only considered income tax treatment and guidance provided for income tax purposes for individual taxpayers trading in crypto assets. Guidance on Value added tax (VAT) treatment were not included in the analysis.

A limitation of the theoretical lens applied in the investigation, was the fact that the service orientation and culture of tax compliance were only considered from the perspective of actions by tax authorities that could improve or undermine trust in tax authorities. The "power of tax authorities" perspective, which is an essential component of the slippery slope framework (Kirchler, *et al*., 2008), has not been considered. It is suggested that further

ISBN NUMBER: 978-0-620-99843-7

investigations could incorporate the power of tax authorities dimension to give a more balanced view of the tax climate that is created with the tax authorities' approach to regulating the crypto environment.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

THE USE OF ARTIFICIAL INTELLIGENCE (AI) TO ASSIST IN IDENTIFYING INCOME TAX EVASION IN SOUTH AFRICA

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ABSTRACT

Tax evasion constitutes an unlawful act whereby a tax liability is either not paid in full or is reduced through the non-disclosure of income or the exaggeration of expenditure claimed as deductions. Many tax authorities globally are utilising emerging technologies to detect and prevent tax evasion. An emerging technological advancement utilised in this respect is Artificial intelligence (AI). The purpose of this research report is to determine whether SARS may utilise AI technology to assist in identifying normal tax evasion in South Africa, and the manner in which AI technology may be utilised in this regard. The research report defines AI technology and tax evasion, examines current measures in place by SARS to detect normal tax evasion in South Africa, examines the use of AI technology by the international tax community to identify and prevent tax evasion, and evaluates whether such AI technology may be utilised by SARS to detect and prevent normal tax evasion in South Africa. This report demonstrates that SARS may enhance its measures to identify and prevent normal tax evasion in South Africa through the use of AI technology.

KEYWORDS

Artificial intelligence; artificial neural networks; deep neural networks; machine learning; South African Revenue Service; tax evasion

LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
ANN	Artificial neural network
CV	Computer vision
DL	Deep learning
DNN	Deep neural network
IRS	Internal Revenue Service
ML	Machine learning
NLP	Natural language processing
OECD	Organisation for Economic Co-operation and Development
PwC	PriceWaterhouseCoopers
RNN	Recurrent neural network
SARS	South African Revenue Service
TAA	Tax Administration Act

ISBN NUMBER: 978-0-620-99843-7

INTRODUCTION

Tax evasion constitutes an unlawful act whereby tax liabilities are either not paid at all or are reduced through non-disclosure of income or the exaggeration of expenditure claimed as deductions (Benn, 2013:6). The Organisation for Economic Co-operation and Development (OECD) describes tax evasion as the use of 'illegal arrangements where the liability to tax is hidden or ignored' (OECD, n.d.).

Tax evasion not merely defrauds governments of revenue to be used for public goods and services, but also disadvantages compliant taxpayers (OECD, 2017). According to a discussion paper by SARS (2005), the effects of tax evasion include, *inter alia*, revenue loss, disrespect for the tax system and legislation, cost to the economy, and undermining the ability of Parliament and National Treasury to set and implement economic policy.

Many tax authorities globally are utilising emerging technology to detect and prevent tax evasion (OECD, 2017:32). One of such emerging technological advancements utilised is artificial intelligence (AI). AI technology is described in broad as computer systems that may sense their environment, think, learn and respond to what they are sensing (PwC, 2017). Tasso (1998) described AI as computer hardware and/or software capable of performing functions similar to that of human cognition.

The Commissioner for SARS has indicated the need for SARS to employ emerging technologies to improve the efficiency and effectiveness of its administration efforts (SARS, 2020b).

RESEARCH QUESTION

The purpose of this research report is to determine whether SARS may utilise AI technology to assist in identifying normal tax evasion in South Africa, and, if feasible, the manner in which AI technology may be utilised.

The research question to be addressed is: May SARS utilise AI technology to assist in identifying normal tax evasion in South Africa, and in which manner may such AI technology be utilised?

ISBN NUMBER: 978-0-620-99843-7

To address the abovementioned research question, the following sub-questions will be addressed:

- What is AI technology?
- What is tax evasion?
- How is normal tax evasion, at present, detected by SARS?
- How is AI technology utilised by the international tax community?
- May AI technology be utilised by SARS to assist in identifying normal tax evasion in South Africa and in what manner may such AI technology be utilised?

To address these research questions, the following framework was applied: first, the research report provides an overview of AI technology; second, defines tax evasion; third, examines current measures in place by SARS to detect normal tax evasion in South Africa; fourth, examines the use of AI technology by the international tax community to identify and prevent tax evasion and, finally, evaluates whether such AI technology may be utilised by SARS to detect and prevent normal tax evasion in South Africa.

RESEARCH METHODOLOGY

The design of the research involves using an integrative literature review to collect, interpret and synthesise the literature to determine whether (and in what manner) AI technology could be used by SARS to address tax evasion (Leedy & Ormrod, 2021; Snyder, 2019:336). An integrative literature review was considered an appropriate method to collect the literature, as the research is of an exploratory nature and may serve as the basis for future research in this field of study (Snyder, 2019:339). The study is, thus, of a qualitative nature. The literature used for the ‘Artificial intelligence’, ‘Tax evasion’ and ‘Current measures by SARS to detect normal tax evasion in South Africa’ sections included, inter alia, textbooks, discussion papers, legislation, journal articles, media reports and white papers.

To determine what AI technologies are utilised in the international tax community to identify tax evasion, the authors used Google Scholar, the OECD website and e-Wits Catalogue to source information on the AI technologies utilised by the international tax community. There was no sample of countries used as all identified instances of AI used by tax authorities from other jurisdictions were included in the paper. To ensure the reliability of the data used in the ‘AI technology utilised in the international tax community to identify tax evasion’ section,

ISBN NUMBER: 978-0-620-99843-7

papers/articles published in connection with reputable organisations or published in peer-reviewed journals were utilised to source information about AI used by the international tax community.

RESEARCH SCOPE AND LIMITATIONS

This research report identifies the manner in which normal tax evasion is, at present, detected by SARS and whether AI technology may assist in identifying normal tax evasion in South Africa. The scope of this research report is, thus, limited to the evasion of normal tax in South Africa.

The report does not provide a feasibility analysis of the use of AI technology by SARS. In addition, this research report does not constitute a detailed technical manual regarding the intricacies of AI technology; technical aspects are, however, explained sufficiently to assist in grasping AI technology concepts and applications. The implications of the Protection of Personal Information Act (POPI) on the use of AI are excluded from the scope of this report.

To facilitate an understanding of AI, the term ‘Artificial Intelligence’ is defined, followed by a review of the types of AI technologies and its capabilities.

ARTIFICIAL INTELLIGENCE (AI)

PwC (2017) broadly describes AI as computer systems that are able to sense their environments, think, learn and respond thereto. Microsoft (2018:28) describes AI as the technology that awards machines the capability to learn and solve problems in a manner similar to humans.

Various forms of AI exist, including machine learning, computer vision, natural language processing and expert systems. It may constitute technology on its own or be integrated with other AI technologies.

Machine learning

Machine learning (ML) constitutes the process whereby machines learn and gain intelligence by utilising example data or past experiences without human assistance

ISBN NUMBER: 978-0-620-99843-7

(Agrawal, Gans & Goldfarb, 2017:3; Sarmah, 2019a:2165). ML includes artificial neural networks and deep learning.

Artificial neural networks

An artificial neural network (ANN) constitutes a computational model (algorithm), consisting of many simple units (neurons) working in conjunction with one another to process data (Russell & Norvig, 1995:593). A neuron works by using a mathematical formula to combine the information it receives into a value and forms an output value, which can then be sent to other neurons within the network (Bougrain, 2004:347). Learning occurs by updating the mathematical formula in the neurons (Russell & Norvig, 1995:567).

There are four different methods of learning, namely, supervised, unsupervised, semi-supervised learning and reinforcement learning (Sarmah, 2019a). Supervised learning entails providing the AI system with existing data of which the outputs are known to train the system in the manner in which to classify new data with similar characteristics as the training data (Bougrain, 2004:348; Nilsson, 2009:513; Sarmah, 2019a:2165). The underlying mathematical formula will then be updated to accurately classify new data (Bougrain, 2004:348; Sarmah, 2019a:2165).

Regarding unsupervised learning, the AI system classifies new data without any prior knowledge of classifications (Bougrain, 2004:349; Nilsson, 2009:513; Sarmah, 2019a:2165). The algorithms search for patterns in the data, to enable the AI system to construct classifications of its own (Bougrain, 2004:349-350; Sarmah, 2019a:2165).

Semi-supervised learning utilises supervised and unsupervised learning techniques (Sarmah, 2019a:2165). In reinforcement learning, the AI system is exposed to the environment and learns through trial and error, and feedback received (Nilsson, 2009:516; Russell & Norvig, 1995:598).

Deep learning

Deep learning (DL) constitutes an advanced form of ML, utilising deep neural networks (DNN) (Sarmah, 2019a:2166; SAS, 2019:2-3). A DNN is an ANN with numerous hidden layers of neurons, whereby each layer interprets input data in a different way and enables

ISBN NUMBER: 978-0-620-99843-7

the application of numerous learning techniques simultaneously (LeCun, Bengio & Hinton, 2015:436; Sarmah, 2019a:2166; SAS, 2019:2-3).

Computer vision

Computer vision (CV) constitutes technology that enables AI systems to retrieve relevant information from images or videos to gain an understanding of the environment (Dawson-Howe, 2014:1; PwC, 2017:26). Potential uses for CV include manipulation, navigation and object recognition. Manipulation entails receiving information and feedback about an environment in order to manipulate it, i.e., a robot requires real-time information about the position of an object to be able to pick it up (Russell & Norvig, 1995:725). Navigation entails receiving information to establish speed, orientation and obstacle-free paths (Russell & Norvig, 1995:725). Object recognition entails receiving information to recognise and classify objects (Russell & Norvig, 1995:725).

Natural language processing

Natural language processing (NLP) entails the process whereby an AI system analyses and understands human language by converting the language into data that the computer comprehends (Eisenstein, 2019:1; Nilsson, 2009:141). These processes are performed through deep learning, utilising a form of DNN referred to as a recurrent neural network (RNN) (Deng & Yu, 2014:299-301). A RNN functions optimally when data is in sequential form (e.g., words in a sentence) as it stores the output of a layer and feeds it back into the input layer to predict a word, based on previous words in a sentence (LeCun *et al.*, 2015:441-442; Microsoft, 2020).

Expert systems

Gevarter (1984:239) describes an expert system as an advanced computer programme that uses knowledge and inference procedures to solve problems that would normally require human expertise for their solution. Expert systems comprise of three parts: (1) a knowledge base, which is a database of information provided by human experts in that respective field, (2) an inference procedure, which provides a solution to the problem using ML and NLP to understand the problem and learn how to solve similar problems in the future and (3) a memory base, which serves as an additional source of information for the inference

ISBN NUMBER: 978-0-620-99843-7

procedure by keeping track of the problem status, storing input data and storing the history of prior problems solved (Gevarter, 1984:240).

Capabilities of AI systems

AI systems may perform specific or numerous integrated tasks (SAS, 2018:3). AI capabilities are set apart from other technological capabilities by the ability of AI systems to continuously learn and adjust according to changes in data (SAS, 2018:3).

There are 5 general capabilities of AI systems, namely automation, prediction, personalisation, providing insights and prescribing solutions to problems (Microsoft, 2019:7). Automation in the AI context refers to the performance of repetitive tasks, without human intervention, in a manner that would be considered intelligent (Hankiewicz, 2018). It is achieved through a combination of ML, CV and NLP (Sarmah, 2019b:15).

Prediction refers to the use of AI to anticipate future events by evaluating known information and generating unknown information from it (Agrawal *et al.,* 2017). This capability utilises ML (specifically DL), CV and NLP (Agrawal *et al.,* 2017).

Personalisation refers to the use of AI technology to create a personal user experience (Microsoft, 2019:7). This is achieved by ML and NLP technology (PwC, 2017:14-15). Providing insights refers to the use of AI technology to recognise patterns and trends in data, draw insight from it to enable users to make better decisions and enhance data analysis (Microsoft, 2019:7). It includes data classification, image and pattern recognition (SAS, 2018:3). It is achieved through a combination of ML, CV and NLP technologies (PwC, 2017:14; Sarmah, 2019b:15).

Prescription of solutions involves an AI system able to provide realistic solutions to problems encountered (Microsoft, 2019:7). It utilises ML, expert systems, CV and NLP technologies (PwC, 2017:12).

Following the analysis of AI and its capabilities, an overview is provided of the types of normal tax evasion schemes apparent in South Africa and the current measures taken by

ISBN NUMBER: 978-0-620-99843-7

SARS to detect such schemes. This is to determine whether AI technology could assist SARS in detecting such normal tax evasion schemes.

TAX EVASION

Tax evasion is defined, in broad, as the utilisation of fraud or deceit to reduce a tax liability (Benn, 2013:6). Tax evasion constitutes an unlawful act, whereby tax liabilities are either, not paid at all, or, reduced through the non-disclosure of income or exaggeration of expenditure claimed as deductions (Benn, 2013:6). The OECD describes tax evasion as the use of 'illegal arrangements where liability to tax is hidden or ignored' (OECD, n.d.). Section 235 of the Tax Administration Act 28 of 2011 (TAA) stipulates that committing tax evasion is a criminal offence punishable with penalties or imprisonment, reinforcing the illegality of tax evasion.

Evasion of normal tax in South Africa occurs primarily through taxpayers not submitting tax returns and not paying tax, or by reducing their tax liabilities illegally (Storm & Coetzee, 2017:161). The most prevalent manner in which taxpayers reduce their tax liabilities involves failing to declare income or overstating expenses (Storm & Coetzee, 2017:161). Income may also be under-declared by fraudulently treating revenue income as capital (SARS, 2012:10).

It is estimated that the annual revenue lost due to tax evasion in South Africa approximates R100 billion (Kieswetter, 2020*)*. The SARS Compliance Programme (SARS, 2012:9) identified priority areas concerning tax evasion, namely, high net worth individuals, large businesses, the construction industry and small businesses.

According to SARS (2018), as of November 2018, 226 investigations were in effect in respect to tax evasion due to under- or non-declaration of income. As of 2013, SARS had identified 2 300 registered high net worth individuals (SARS, 2012:10). It was noted that 467 of these individuals had discrepancies between their declared income and their asset bases, denoting under- or non-declaration of income (SARS, 2012:10). In a webinar held in 2021, Judge Dennis Davis recounts a study performed whereby a SARS employee recorded the registration numbers of 26 Ferraris parked outside a local hotel and later correlated the list to the taxable income declared by the relevant owners (Nedbank Private Wealth, 2021). The

ISBN NUMBER: 978-0-620-99843-7

study found that none of the 26 individuals reported a taxable income of more than R400 000 per year, which is inconsistent with a lifestyle of owning a Ferrari (Nedbank Private Wealth, 2021).

To dissuade taxpayers from evading tax, SARS has aimed to increase the probability of identifying tax evaders and increasing the severity of punishment (PwC, 2019:12; SARS, 2020b). The Commissioner for SARS has stated that SARS needs to construct a data intelligent organisation and utilise emerging technologies to improve the efficiency and effectiveness of SARS' administration efforts (Kieswetter, 2020; SARS, 2020b).

CURRENT MEASURES BY SARS TO DETECT NORMAL TAX EVASION IN SOUTH AFRICA

SARS has several measures in place to detect instances of tax evasion by taxpayers (SARS, 2012). The most pervasive of these measures is the audit of taxpayers, in which 13% of all registered taxpayers are audited (SARS, 2019:49). SARS does not only target specific taxpayers to audit, but also performs audits on a random basis to verify information submitted by taxpayers (Lake, n.d.).

SARS has a computer system that monitors tax risk and employs a risk-based engine to detect possible instances of tax evasion (Loftie-Eaton, 2016). Certain third parties are required by law to forward information regarding taxpayers to SARS (SARS, 2020c). For example, South African banks are required to submit information to SARS regarding interest that accrued to taxpayers (SARS, 2015b). The computer system compares information received from taxpayers to the information received from third parties to determine whether the information declared by the taxpayer is correct and complies with the Income Tax Act (SARS, 2020c). If the system identifies any inconsistencies, these taxpayers would be flagged for audit or official investigation (Loftie-Eaton, 2016; SARS, 2015a:32).

SARS is a party to an automatic exchange of information agreement in terms of the OECD's Common Reporting Standards (SARS, 2020d). SARS receives information regarding taxpayers, who are liable for tax in foreign jurisdictions, from other Common Reporting Standards exchange countries (SARS, 2020d). SARS may then utilise the information

ISBN NUMBER: 978-0-620-99843-7

obtained to establish whether the taxpayer is utilising foreign entities to evade tax in South Africa (SARS, 2020d).

SARS may choose to audit taxpayers where the information disclosed in a current year of assessment varies significantly from prior years of assessments and where no clear reason for the variation exists (Lake, n.d.). SARS utilises non-AI data analytics to analyse returns submitted by taxpayers to detect instances where significant variations from prior years exist in the information submitted (SARS, 2020a:13). A SARS official will manually review the return where variations are identified to determine if an audit is required (Lake, n.d.; SARS, 2020a).

Another method that SARS utilises to identify tax evasion is through its Voluntary Disclosure Programme (SARS, 2012). Taxpayers who previously committed tax evasion may voluntarily report themselves to SARS to reduce their punishment and damage to their business and reputation (SARS, 2012). Furthermore, SARS operates a programme whereby any person may contact SARS to anonymously report another taxpayer should they suspect such taxpayer of evading tax (SARS, 2012:20; SARS, 2013:3).

SARS also identifies tax evasion through criminal investigations launched in respect of a taxpayer (SARS, 2012). SARS will launch an official investigation when a taxpayer has been cited in the media for possible tax evasion (Lake, n.d.).

Having considered normal tax evasion schemes and measures taken by SARS to detect such schemes, an overview follows of how AI technology is used internationally to identify normal tax evasion.

AI TECHNOLOGY UTILISED IN THE INTERNATIONAL TAX COMMUNITY TO IDENTIFY TAX EVASION

The most prevalent use of AI technology by international tax authorities is the use of ML and statistical functionalities in a system that has predictive or prescriptive capabilities (OECD, 2016:17). The OECD (2016:18) noted that these systems did not introduce new tasks to the tax administration of such authorities, but rather performed existing tasks with less reliance

ISBN NUMBER: 978-0-620-99843-7

on human judgement. These tasks include, *inter alia*, selecting audit cases, debt management and constructing taxpayer communications (OECD, 2016:18).

The Dutch Tax Authority utilises an AI system to identify possible cases to audit where suspicion exists that a taxpayer is claiming false expenses or overstating expenses to evade tax (OECD, 2016:22). The AI system has DL characteristics and specifically uses a DNN where different layers of the DNN are modelled to predict different outcomes (OECD, 2016:22). Gesley (2020) noted that the system makes these predictions by comparing the data submitted by the taxpayer to information obtained from government or public agencies. As more predictions are made by the system, the system will learn and adjust its DNN algorithms to improve predictive capabilities (OECD, 2016:22). The AI system utilises a DL method whereby it refers to historic tax evasion data to learn how to recognise patterns that indicate and predict potential tax evasion (OECD, 2016:23).

The Tax Administration in Singapore uses an AI system with ML, CV and NLP characteristics to perform social network analysis (OECD, 2016:21). The system identifies taxpayers that may be under-declaring income by comparing the income declared to their lifestyle portrayed on social media (OECD, 2016:21). The system learns by utilising historic data to identify patterns that the system will seek when analysing new data (OECD, 2016:21). Where the system notes that the taxpayer portrays a lifestyle not explained by his or her declared income, the system will flag the taxpayer for audit (OECD, 2016:21).

The Australian Taxation Office uses an AI system to identify fraudulent deductions (OECD, 2016:23). This system uses ML and NLP along with an unsupervised learning method to analyse patterns and relationships between sets of data to predict new types of fraudulent deductions used to commit tax evasion (Australian Taxation Office, 2019; OECD, 2016:23).

The Revenue Commissioner in Ireland has a dual income-consumption AI system that utilises a semi-supervised learning method (OECD, 2016). The one component of the system utilises ML with ANN and NLP technologies to identify taxpayers that are potentially under-declaring income by utilising an unsupervised learning method that compares the taxpayer's return to that of similar taxpayers to identify any abnormalities for further investigation (OECD, 2016:23). The other component of the system utilises ML, ANN and

ISBN NUMBER: 978-0-620-99843-7

NLP technologies with supervised learning to identify tax returns with under-declared income, by comparing it to patterns of under-declaration in past cases (OECD, 2016; SAS, 2020).

The Internal Revenue Service (IRS) in the United States of America utilises various AI systems (Federico & Thompson, 2019; Flesher & Hicks, 1990; OECD, 2004; OECD, 2016). The most recent of these is the Palantir Gotham AI system (Federico & Thompson, 2019:45). This AI system utilises ML and NLP with an ANN that automates the investigative tasks previously performed by IRS personnel (Federico & Thompson, 2019:45; Palantir, 2020). The system automatically selects cases to audit, by processing the information in the IRS databases to determine tax returns presenting a high risk of potential tax evasion (Federico & Thompson, 2019:45-46; Palantir, 2020). The IRS has an AI expert system, referred to as the Automated Under-reporter Expert System, that is programmed based on the experience and knowledge of tax examiners (Flesher & Hicks, 1990:52). The system utilises data from many sources to determine if the taxpayer has underreported his or her income (Flesher & Hicks, 1990:52). The Minnesota Department of Revenue uses an updated version of this system to improve audit selection of cases with underreported income (Hsu, Pathak, Srivastava, Tschida & Bjorklund, 2015). The system utilises ML and an ANN to identify individuals who may be evading tax (Hsu *et al.*, 2015:222). The system operates a supervised learning method, where it learns from the experiences and knowledge of tax audit experts in addition to real-world data (Hsu *et al.*, 2015). The IRS, furthermore, has other AI systems with ML and NLP technologies with a variety of predictive capabilities (OECD, 2004:14; OECD, 2016:23). One such system analyses the links between related entities to detect misreporting of income or deductions at the company-level (OECD, 2016:23).

The Indian Income Tax Department operates an integrated data system that performs a variety of functions by interpreting data from various sources (Tewari, 2014:217). This system has components that utilise AI technology, in particular ML, ANN and NLP, to perform predictive and prescriptive functions (Tewari, 2014:219). The AI components of this data system enables the detection of taxpayers that do not pay taxes (Non-filers Monitoring System) and the identification of under-reporting of income (computer-aided scrutiny selection) (Tewari, 2014:213-125).

ISBN NUMBER: 978-0-620-99843-7

The Canadian Tax Authority utilises a National Risk Assessment System, that utilises a risk-based approach to identify tax evasion (OECD, 2004). It is an expert system embedded with a ML system with an ANN that utilises a supervised learning method to delineate and detect the characteristics of taxpayers who evade tax (González & Velásquez, 2013; OECD, 2004). The system learns by referring to the knowledge of experienced auditors together with the results of past audits (González & Velásquez, 2013:1428). The system may detect patterns of evasion to identify taxpayers that are at a high risk of tax evasion before such evasion even occurs (González & Velásquez, 2013:1428; OECD, 2004:26).

Tax authorities in Chile operate an AI system that assesses the risk of tax evasion at different stages of the taxpayer's lifecycle (González & Velásquez, 2013:1428). The system utilises ANN and NLP technologies to detect potential false invoices from the information submitted by the taxpayers (González & Velásquez, 2013:1428).

Mexico's Tax Authority utilises a ML system to model taxpayer behaviour and predict which taxpayers are at high risk of committing tax evasion before such evasion even occurs (PwC & Microsoft, 2017:29). The system utilises data from various government departments along with the historic information of the taxpayer to develop the risk model (PwC & Microsoft, 2017:29).

The Spanish Tax Agency noted that its audit personnel experienced difficulty in identifying companies that were potentially evading tax, due to the vast amounts of data and the complexity of some businesses (Tomé, 2016:19). It consequently decided to automate the process by implementing an AI system that utilises ML, CV and an ANN to make decisions that the audit personnel would make (Tomé, 2016:20). The system is able to automatically identify if a case should be audited, or, where limited data is available in the system, provide the auditor with such information it was able to obtain (Tomé, 2016:20). The system utilises reinforcement learning, as the results of the decisions made are fed back into the system, to revise and update algorithms for future decisions (Tomé, 2016:19).

ISBN NUMBER: 978-0-620-99843-7

Table 1: Findings

Country	Brief description of AI use	Use of machine learning	Use of computer vision	Use of Natural Language Processing	Use of expert systems
Netherlands (OECD, 2016)	Identifies taxpayers that claim false expenses or overstate their expenses.	✔	✕	✔	✕
Singapore (OECD, 2016)	Performs social network analysis to identify taxpayers that under-declare income.	✔	✔	✔	✕
Australia (OECD, 2016; Australian Taxation Office, 2019).	Identifies cases of fraudulent deductions.	✔	✕	✔	✕
Ireland (OECD, 2016; SAS, 2020)	A dual AI system that identifies taxpayers with under-declared income.	✔	✕	✔	✕
United States of America (Federico & Thompson, 2019; Palantir, 2020)	Automates the audit case selection process by identifying cases with a high risk of potential tax evasion.	✔	✕	✔	✕
United States of America (Flesher & Hicks, 1990; Hsu *et al.*, 2015)	Identifies taxpayers with under-declared income.	✔	✕	✔	✔
United States of America (OECD, 2016)	Predicts if there is misreporting of income or deductions in a group of companies.	✔	✕	✔	✕
India (Tewari, 2014)	Identifies taxpayers that do not pay tax and identifies taxpayers with under-declared income.	✔	✕	✔	✕

ISBN NUMBER: 978-0-620-99843-7

Canada (OECD, 2004; González & Velásquez, 2013)	Identifies taxpayers that are at a high risk to evade tax before the evasion even occurs.	✔	✘	✔	✔
Chile (González & Velásquez, 2013:1428)	Detects cases of possible false invoicing.	✔	✘	✔	✘
Mexico (PwC & Microsoft, 2017)	Predicts which taxpayers are at a high risk of committing tax evasion before the evasion even occurs.	✔	✘	✔	✘
Spain (Tomé, 2016)	Automatically identifies if a case should be audited by predicting the decisions that the audit personnel would make.	✔	✔	✔	✘

Source: Author's construction

The manner in which AI technology may assist SARS in identifying normal tax evasion in South Africa is delineated below, taking into consideration the capabilities of AI technology, the current measures taken by SARS to detect normal tax evasion schemes in South Africa as well as the international tax community's use of AI technology to identify tax evasion.

THE UTILISATION OF AI TECHNOLOGY IN SOUTH AFRICA TO DETECT NORMAL TAX EVASION

For an AI system to be useful to SARS, it will need to be designed to perform specific functions required by SARS. The AI system designed by SARS must be able to identify the specific types of normal tax evasion present in South Africa.

Businesses and high net-worth individuals pose the biggest risk to evading normal tax (SARS, 2012:9; SARS, 2020a). The most common form of normal tax evasion, by the aforementioned taxpayers, is the deliberate underreporting or non-declaration of income (Storm & Coetzee, 2017:161). This occurs in many different ways including treating revenue

ISBN NUMBER: 978-0-620-99843-7

amounts as capital, using sales suppression technology to understate income, overstating expenses, or simply not declaring or under-declaring amounts (OECD, 2017).

The research demonstrated that the capabilities of AI technology may assist in identifying normal tax evasion in South Africa, as delineated below:

- First, to identity overstatement of expenses;
- Second, to identify underdeclared income; and
- Third, to identify tax evasion prior to its occurrence.

The utilisation of AI technology in identifying the overstatement of expenses is possible in South Africa. The Dutch Tax Authority already has an AI system in place that may identify cases where suspicion of the overstating of expenses exists (OECD, 2016:22). Australian and Chilean tax authorities also operate AI systems with a similar purpose of identifying false deductions (González & Velásquez, 2013:1428; OECD, 2016).

The utilisation of AI technology in identifying undeclared income is also possible in South Africa. Various countries, including the United States of America, India and Ireland, at present, operate an AI system to identify taxpayers that have underdeclared their income (Hsu *et al.*, 2015; OECD, 2016:23; Tewari, 2014:213-125).

AI technology is not merely utilised to identify tax evasion that has occurred; it is also utilised, in jurisdictions such as Canada and Mexico, to identify cases where tax evasion may occur in the future (OECD, 2004; PwC & Microsoft, 2017:29). SARS, at present, only receives data from the taxpayers themselves, the third parties who are required by law to send taxpayer information to SARS and the information received automatically in terms of the OECD's Common Reporting Standards (SARS, 2020c; SARS, 2020d). This limits SARS' ability to identify tax evasion prior to its occurrence. If an AI system similar to that operated in Mexico and Canada could be implemented, SARS would be able to identify tax evasion prior to its occurrence.

Recommendations

Based on the above research findings, it would be possible for SARS to utilise AI technology to assist in identifying current and future tax evasion schemes. It is recommended that SARS

ISBN NUMBER: 978-0-620-99843-7

implements AI technology to assist in identifying tax evasion in South Africa. The discussion below delineates the possible manner in which SARS could implement AI technology.

SARS may implement an AI system able to perform a specific function i.e., to predict cases with a high probability of misreporting of income for audit. SARS already operates a computer risk-based engine that assists it in selecting cases based on risk profiles (Loftie-Eaton, 2016). SARS should, therefore, follow the example of the Peruvian tax authority to convert its current system to an AI system (González & Velásquez, 2013:1428). SARS should convert its risk-based engine into an expert system, similar to the one operated by the IRS. As the system will perform one specific task, it should have ML and, specifically, an ANN. NLP technology may also be required to comprehend the information to be processed.

Since new methods of tax evasion will continue to arise, SARS should implement an AI system capable of semi-supervised learning (OECD, 2016:23). The semi-supervised model should be similar to that employed in Ireland. The supervised component will utilise data from past cases along with the experience from tax experts to learn the patterns of misreporting of income that currently exists. The unsupervised component will learn to identify potentially new types of misreporting of income by comparing the taxpayer's information to that of similar taxpayers.

The AI system of SARS should have automation and prediction capabilities, as it would need to automatically process data, without human involvement, and predict which taxpayers would potentially misreport their income, so that such taxpayers may be audited.

SARS should consider implementing an AI system with a design similar to the system operated by the Singapore Tax administration. Such AI technology identifies, through a social network analysis system, wealthy taxpayers that underdeclared income (OECD, 2016:21). The system should be able to predict which taxpayers potentially under-declare their income, by comparing their lifestyle portrayed on social media to their income declared to SARS. Such an AI system may utilise ML with an ANN, computer vision and NLP technologies. The system should be able to analyse vast amounts of data in a short timeframe, to perform lifestyle audits on all resident taxpayers on social media platforms.

ISBN NUMBER: 978-0-620-99843-7

Utilising AI technology will enable SARS to identify possible tax evasion cases more effectively, as the system is able to process data more rapidly than a human. ML technology will ensure the system is more accurate than a human. Unsupervised or deep learning will enable the identification of current tax evasion schemes as well as new methods to evade tax.

In summary, as SARS already operates a computer system able to perform risk-based procedures for audit case selection, it has the basic infrastructure in place to implement an AI system (Loftie-Eaton, 2016; SARS, 2011:3). It is recommended that SARS upgrades its current risk-based computer engines to include AI technology, specifically ML with an ANN or DNN, and NLP. The system to be implemented should also have automation and prediction capabilities.

Table 2: Outline of AI technology recommended for implementation by SARS

Tax evasion risk	Brief description of AI to address risk	Use of machine learning	Use of computer vision	Use of Natural Language Processing	Use of expert systems
Underreporting or non-declaration of income by individuals and businesses.	A dual component AI system that may predict which taxpayers have potentially misreported their income. One component detects types of misreporting that currently exists, while the other component detects new types of misreporting.	✔	✘	✔	✔
High net-worth (wealthy) individuals under-declaring income	The system may compare taxpayers' lifestyles portrayed on social media to the income declared to SARS to predict taxpayers	✔	✔	✔	✘

ISBN NUMBER: 978-0-620-99843-7

	who have potentially underdeclared their income.				

Source: Author's construction

CONCLUSION

Tax evasion constitutes the unlawful act of reducing a tax liability, whereby it is either not paid at all, or, is reduced by the non-disclosure of income or the exaggeration of expenditure claimed as deductions (Benn, 2013). SARS loses tax revenue of approximately R100 billion per year due to tax evasion and related causes (Kieswetter, 2020).

The world is becoming more digitised, with an unprecedented amount of data available to tax administrations (Microsoft & PwC, 2018; PwC & Microsoft, 2017). Tax authorities may achieve operational efficiency by optimally analysing such data (Microsoft & PwC, 2018), as well as utilising new technologies to process and interpret it (Deloitte, 2019). AI technology may be utilised to identify tax evasion (PwC & Microsoft, 2017). The main difficulty in identifying tax evasion, at present, is the difficulty for humans to process voluminous amounts of data (Tomé, 2016). AI technology may remedy this by being able to analyse such data at the same (or higher) level of accuracy than a human, by identifying patterns and trends in the data, and by being able to process vast amounts of data at rapid speeds (Microsoft, 2018; Microsoft, 2019; PwC, 2017).

AI technology has revolutionised the manner in which tax authorities identify and address the risk of tax evasion (OECD, 2017). Many tax authorities globally are already utilising AI technology to detect and prevent tax evasion (OECD, 2016). It is recommended that SARS implement AI technology to assist in identifying and preventing normal tax evasion within South Africa.

Though a feasibility study regarding the implementation of an AI system by SARS is not within the scope of this report, such research would be valuable. Further areas of research include the utilisation of AI technology to identify all forms of non-compliance (not merely tax evasion), the utilisation of AI technology to identify tax evasion with respect to other forms of tax, the implications of the POPI on the use of AI, as well as research regarding the technical aspect of implementing an AI system by SARS.

ISBN NUMBER: 978-0-620-99843-7

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ISBN NUMBER: 978-0-620-99843-7

2022 Southern African Accounting Association National Virtual Conference Proceedings

ISBN NUMBER: 978-0-620-99843-7

Online Learning Behaviour of South African Accounting Students during the Pandemic

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ABSTRACT

The coronavirus disease 2019 (COVID-19) resulted in an unprecedented year, with the higher education sector not excluded from the impact of the pandemic. The consequences of the COVID-19 outbreak, including restrictions placed to curb the spread, resulted in a sudden and unplanned change to South African contact universities. Shifting from traditional face-to-face learning to online learning impacted both students and educators. This study considers the online behaviour of second year Auditing students enrolled at a South African university, with a focus on the time taken to access online resources and the association that this had on students' marks. The results indicate that students may have procrastinated as they took 130 days on average to access online resources. Further, the extended period to access resources has a negative association with student's marks. In terms of resource access, all students were found not to have accessed most of the resources provided to them with failing students accessing far less resources than their passing peers. Given the procrastination and lack of access by students, this is a possible indication that students lack the ability to self-regulate which is required for successful online learning.

KEYWORDS

COVID-19; higher education; online learning; procrastination; self-regulation; time management

INTRODUCTION

Although learning environments are changing with the changes in technology and online learning is becoming more common, the coronavirus disease (COVID-19) outbreak significantly disrupted the higher education sector in 2020, like many other sectors (Delen & Liew, 2016; Gonzalez *et al*., 2020; Rapanta *et al*., 2020). South African universities were not exempt from the consequences of the unanticipated changes caused by the pandemic, despite experience relating to prior disruptions such as the *#FeesMustFall* protest (Mpungose, 2020b; Wangenge-Ouma & Kupe, 2020). Given the increasing lock-down levels implemented within the country, South African universities were forced into emergency remote learning to ensure the academic year could be completed (Wangenge-Ouma & Kupe, 2020). The change to online learning was implemented on an urgent, unplanned basis without any transition or 'easing in' period that is usually accompanied with major educational changes (Gonzalez *et al*., 2020; Mishra *et al*., 2020). In South Africa, both educators and students were impacted with neither being spared, given that out of South Africa's 26 public universities, only 1 university is a dedicated distance learning university with all other universities mainly dependent on face-to-face teaching (Mpungose, 2020b; Wangenge-Ouma & Kupe, 2020). At the University of Witwatersrand, face-to-face contact was suspended and on 20 April 2020. Therefore, online learning was used to deliver the remainder of the academic year. It is against this backdrop that this research is undertaken.

Online learning is where students can access learning using some form of technology which allows learning to occur without physical face-face learning required (Benson, 2002; Conrad, 2002; Mpungose, 2020a; Mpungose, 2020b). Online learning allows students to use the internet to access course resources, access the educator and obtain the required help and support to complete the courses (Ally, 2004). Online learning provides students with flexibility and autonomy, however students are required to be self-regulated and self-directed to be successful (Delen & Liew, 2016; Kauffman, 2015). Students have to be motivated and exhibit self-discipline to ensure they succeed in an online learning environment (Cunningham, 2010). Self-regulation is focused on the online student themselves and their ability to control their own learning (Lynch & Dembo, 2004; Moore *et al*., 2011). The concept of self-regulation given the sudden implementation of online learning will be considered in this article. Self-regulation specifically in terms of the time taken to download course content and the association with students' marks will be examined. The

ISBN NUMBER: 978-0-620-99843-7

focus group of the study will be students that were enrolled in a second year Auditing course during 2020. It is important to acknowledge that within a South African context there are other factors which impact students' behaviour that are not in the scope of the study. This includes the differences in students background such as students who come from disadvantaged backgrounds, the lack of access to resources such as computers and the internet by students and the inexperience regarding the use computers (Bagarukayo & Kalema, 2015; Brown *et al*., 2008; Queiros & De Villiers, 2016).

The article begins with the literature review relating to online learning self-regulation and time management. An overview of the second year Auditing course is provided. The method used in the study is discussed next. This is followed by the results section and lastly the conclusions reached.

LITERATURE REVIEW

Online learning

Online learning is used to describe learning that does not take place face-to-face but occurs at a distance (Gonzalez & St Louis, 2008), using devices such as computers, tablets, laptops and cell phones (Gonzalez & St Louis, 2008). Online learning is meant to allow students to learn at any time and place (Dhawan, 2020). As the students and the educator are in different locations, information can be delivered using different methods (Carswell & Venkatesh, 2002). Online learning can take place real-time, for instance with Skype or Microsoft Teams (synchronous learning), or it can occur with a time-delay by using for example, forums or podcasts (asynchronous learning) (Gonzalez & St Louis, 2008). From a global university education perspective online learning is gaining* momentum given the higher costs associated with traditional learning for instance the costs associated with transportation, residential accommodation or building new infrastructure for expansion (Çakýroglu, 2014; Dhawan, 2020; Queiros & de Villiers, 2016; Seaman *et al*., 2018). This is further enhanced by other online learning advantages including cost-effectiveness, accessibility, flexibility, the option to not attend campus and collaboration (Pollard & Hillage, 2001; Rodriguez *et al*., 2008). Online learning also breaks down traditional borders between countries and creates a global classroom. Classes are able to expand without being limited to classroom size or availability (Perry & Pilati, 2011).

ISBN NUMBER: 978-0-620-99843-7

According to Ali and Leeds (2009) the drop-out rates for online courses were much higher than traditional face-to-face learning. There are different factors impacting students success which can be considered when determining if students are ready for online learning (Smith, 2005). Students must believe they can achieve something as this assists them in monitoring their learning and taking control of their learning allowing them to make judgements on their progress (Alqurashi, 2016; Petrides, 2002; Shapley, 2000). Students experience with the Internet and the use of computers is also a key element for online learning success (Schrum & Hong, 2002). Students who are unable to self-regulate tend to achieve lower marks in an online learning environment, compared to students who can direct and regulate their own learning (Pillay *et al*., 2007). Self-regulation allows students to overcome the different hurdles experienced with online learning such as procrastination (Elvers *et al*., 2003).

Self-regulation and online learning

Self-regulated learning is defined as the extent to which students are meta-cognitively, motivationally and behaviourally active in achieving their learning outcomes (Peters, 1999; Zimmerman, 2000). Self-regulation has been identified as a critical factor in student academic success (Jung, 2001; Peters, 1999). Self-regulation is therefore, particularly important in the context of the COVID-19, and the move to emergency remote learning (Gonzalez *et al*., 2020). This is because online learning gives more control regarding the learning material to students when compared to traditional learning (Garrison, 2003). In an online setting the monitoring responsibility shifts to the student and if learning obstacles are experienced the student is required to seek the necessary help to rectify the lack of understanding (Song & Hill, 2007). A study by Usman and Ivana (2019) found that students who are diligent, confident and independent have a better understanding of the content in an Accounting course.

Given the pandemic, students have had to adjust their environments and behaviours to become self-regulated (Gonzalez *et al*., 2020; Zimmerman, 2000). Self-regulated students focus on learning strategies and appropriate and specific goal setting with reduced distractions (Zimmerman, 2000). They seek assistance when and as they need it, control important parts of their environment to ensure that their learning environment is conducive to learning and are active participants of their learning (Pintrich, 2000; Zimmerman, 2000). Some of the possible reasons for students dropping-out of online learning include: students

ISBN NUMBER: 978-0-620-99843-7

underestimate the time required to complete tasks, display a lack of coping strategies and do not show commitment to goals (Artino, 2008; Cho & Jonassen, 2009). The lack of self-regulation leads to other issues such as procrastination.

Time management

Time management refers to a student's ability to manage their time adequately to allow them to achieve their academic tasks within the required period of time (Koch & Kleinmann, 2002; Lynch & Dembo, 2004). Given that time is a limited resource, students need to use this resource effectively to complete the different tasks required such as attending lectures, completing tutorials, consulting where required, studying and writing exams (Özer *et al*., 2009; Pehlivan, 2013). Time management is not a single trait or skill, but is a process where students determine and plan when, where and how long they engage in academic work (Wolters *et al*., 2017). Students who are able to self-regulate understand that they must be able to manage their time to avoid unnecessary delays which will hinder them from achieving their academic goals (Wolters *et al*., 2017). Time management plays a significant role in online courses as these require significantly more time than contact programmes (Moore *et al*., 2011; Peters, 1999).

Dhawan (2020) indicated the issue with time management and online learning is that online learning provides students with flexibility and more time, that students do not find the time to complete the required work. Procrastination is where individuals engage in behaviour which results in unnecessary delays that restricts them from reaching their goals (Chun Chu & Choi, 2005; Steel, 2010). Students seem to spend more time on activities, such as gaming or social media, not related to their academic tasks which hinders progress (Liborius *et al*., 2019; Panek, 2014). In terms of academic procrastination, it is where students voluntarily delay the completion of academic tasks, despite knowing the consequences of the action (Day *et al*., 2000). Students who procrastinate encounter issues with their allocated learning such as preparing for exams, submitting assignments on time and dealing with deadlines such as the handing in of library books (Schouwenburg & Lay, 1995; Visser *et al*., 2018). Solomon and Rothblum (1984) found that students procrastinated the most regarding the writing of research papers (43% of students). However, students were also found to delay studying for exams (28%) and completing other academic tasks (23%). In the study by Özer *et al*. (2009), 52% of students were classified as procrastinators. As time management is

ISBN NUMBER: 978-0-620-99843-7

key to online learning, the first question considers if second year Auditing students procrastinated:

RQ1: Did second year Auditing students engage in academic procrastination when online learning was introduced?

Prior studies indicate that procrastination has a negative effect on students learning, marks and the completion rate of courses as students are more likely to drop out of the course (Balkis *et al*., 2013; Cerezo *et al*., 2017; Eastin & LaRose, 2000; Gibson, 1998; Van Eerde, 2003; Visser *et al*., 2015). A reason for this could be that when individuals procrastinate, this does not allow an individual to reach their maximum capabilities (Wolters *et al*., 2017) and impacts their physical health and mental well-being (Kim & Seo, 2013). When students procrastinate it results in time pressure to complete the work, which may result in work produced being inaccurate and of a lower quality (Van Eerde, 2003). This is because procrastination leads to other issues such as anxiety, unnecessary cramming of work before assessments, guilt, a fear of failure, cheating and less motivation to succeed (Ferrari & Scher, 2000; Fritzsche *et al*., 2003; Özer *et al*., 2009; Roig & DeTommaso, 1995; Steel, 2007). Malan (2020) found that for an online accounting degree, students who are fully engaged with a module in the degree were found to be more successful in the module than students who lacked engagement. Rotenstein *et al*. (2009) conducted a study on graduate accounting students and also concluded that when students start their assignments earlier, they performed better compared to students who delay the starting of their assignments. Positive relationships have been found between effective time management and the marks achieved by students (Basila, 2014; Huie *et al*., 2014). Based on prior research and the association between academic procrastination and time management, the following research question is posed:

RQ2: If students engaged in procrastination, what is the association with their marks?

An overview of the second year Auditing module is provided next, including a discussion to the type of resources provided as part of the course.

ISBN NUMBER: 978-0-620-99843-7

The second year Auditing module

Auditing II is a module for second-year students pursuing a Bachelor of Commerce in Accounting degree or the Chartered Accountant qualification (Bachelor of Accounting Science). The module is lectured in the School of Accountancy, which falls under the Commerce, Law and Management Faculty. There were 705 full-time students registered for the course in 2020.

In the traditional contact-based module lectures are offered once a week with a live tutorial conducted every second week. Normally, lectures and tutorials are not recorded, all content is printed and uploaded on the learning management system, Sakai, for students. Lectures entail the educator presenting content to students. Students receive a course outline at the beginning of the year, indicating the topics to be covered, the applicable week and an outline of what will be covered in the lecture. Before assessments, a revision lecture is also completed. In this lecture the content previously lectured is recapped, with a focus on content where students experience difficulties.

In terms of tutorials this could be seen as active learning. Active learning is where students are engaged in meaningful tasks as they take control of completing the content (McGown *et al*., 1996). Within the School of Accountancy, tutorials have been emphasised as a key learning tool and are viewed as key to the Auditing module. The second year Auditing tutorials comprises of 30 students, with a student tutor allocated to different classes. The last type of resource provided to students is self-reflection resources. This relates to student's assessment, solutions, and exam feedback, which students download and examine to identify what went wrong in their exam and how to correct their errors.

With the change to online learning, no live lectures or tutorials were held. As a result, all lecture and tutorial content were recorded for students and uploaded on the LMS. Recorded sessions allow students to revise content or refer back to it for further clarification (Robertson & Flowers, 2020). In addition to receiving the content that would be provided in a traditional setting, all lecture content was recorded for students and uploaded online. The University was also able to reach a solution with service providers to zero-rate Sakai, to allow all students to have access to the course content. In a face-to-face environment guidance regarding the sections to be covered is provided in terms of the course outline.

ISBN NUMBER: 978-0-620-99843-7

For the purposes of online learning a more detailed planner was provided to students given the absence of fixed lecture slots and fixed tutorial times which normally determined students' days at university (Figure 1).

Week	Week beginning	Lecture topic	Tutorial topic	Student to-do list	Tutorials	Consultations
1 - online	20 April 2020	King IV part 2	CPC intro tutorials and CPC main tutorials (revision from block 1)	1. Complete CPC intro and CPC main tutorials 2. Download CPC intro and main tutorial videos 3. Watch tutorial videos 4. Pre-read Chapter 4 of the Fundamentals of Auditing text book 5. Download King-IV lecture slides (resources) 6. Download King IV lecture video (part 2 (Principles King IV-7,8,9,10 & 11) 7. Watch Lecture videos 8. Post-read and work through the textbook	CPC Intro – ***ET4;ET6;ET7;ET8; Past paper pack - Test 1 (March test) 2018 (Required 3)*** CPC Main – ***ET2;ET3;ET5;ET9;ET10; Unseen: Past paper pack - June 2018. Question 2 (Required 1) Self-study ET1***	Forum or email (see orientation video for guidance)

Figure 1: Weekly planner example

The weekly planner included the lecture topic, the tutorials that will be covered for the week as well as a list of what students were required to complete. The intention of the planner was to provide guidance to students regarding the tasks required for a module to plan their schedules and complete the required tasks on time.

METHOD

This study uses a correlational research design and uses archival data of full-time students enrolled in the second year Auditing module at the University of Witwatersrand. The main source of data for the study comprised of the reports obtained from Sakai and the report that includes students' final year-to-date marks. This archival data were used to compare both student online activity[1] and student academic performance (measured by final course grade). Correlational designs do not allow for an explicit finding of causation (Fraenkel *et al*., 1993; Tuckman & Harper, 2012), but do strongly suggest whether or not online activity had an association with student academic performance. Additionally, since correlational

1 Online activity was measured by considering the resources accessed and time to access resources.

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design takes place after data was collected and without any manipulation or intervention, it allowed for the exploration of naturally occurring relationships between groups. Similar methods have been employed by Judd and Elliott (2017) and Kim and Seo (2015).

Sample selection and size

The sample comprised full-time students registered for the second year Auditing module in 2020. There were 705 students registered for the course in 2020.

Data collection

The access reports from Sakai contain a description of the resources accessed by students and the date accessed. The description of the resources is based on the naming convention when the resources is attached to Sakai. Each resource was categorised using the following categories: lecture material, lecture video, tutorial material, tutorial video, self-reflection, revision and other. The time to access the resource was calculated based on the date uploaded to the date the student first accessed the resources. There were cases where students accessed the same resources multiple times, only the first access was considered, all other dates of access were not considered. The final year-to-date mark for students was also obtained. Students were categorised as a passing or failing student. Passing students are those which have 50% or more and failing students are those with less than 50%. The data used in the study is archival and has not been edited by the researchers.

Analysis of access reports

Descriptive statistics are used to analyse the access reports. The analysis of the resources accessed the time to access resources and the association with the students' marks are presented in graphic or tabular format. Data is presented in tabular format for ease of interpretation and provided the basis for concluding on the research questions. During the analysis, inspection of the number of items were performed to ensure that all items were analysed. Analysis of the data were performed using appropriate statistical techniques such as Mann-Whitney tests to determine if differences are significant. Validity of the findings are discussed in the results section.

ISBN NUMBER: 978-0-620-99843-7

RESULTS

The results begin with an overview of the resources provided to students. This is followed by an analysis of the time taken to access resources and the association that this has on students' marks. The next section considers students access to resources and the association this has on students' marks.

Overview of resources provided

A total of 387 resources were uploaded for the second year Auditing module. Table 1 provides a breakdown of the resources uploaded. Tutorial content (material and videos) accounted for majority of resources (61%) uploaded, followed by lecture content (material and videos) (18%). Usually within a traditional face-to-face environment, only two tutorials are completed by students, with students required to complete the remaining tutorials and seek consultation with educators where help is needed. Given the move to online learning it was decided to provide more tutorial content to students to facilitate their learning.

Table 1: Breakdown of resources

Topics	Revision	Lecture Material	Lecture Videos	Tutorial Material	Tutorial Video	Self-Reflection	Extra Material	Total
Resources uploaded	24	30	40	125	111	36	21	387
Percentage -%	6%	8%	10%	32%	29%	9%	5%	100%

Although guidance was provided to students via the weekly planner as indicated in Figure 1, students do not seem to be accessing this resource as much as would have been expected as indicated in Figure 2. 15 weekly planners were provided to students and on average only 273 students (39%) accessed the planners. 611 (87%) students accessed at least one planner, whereas 94 students (13%) did not attempt to access one planner that was provided. Although 611 students accessed some planner, it is interesting to note that most of these students accessed only one planner (76 students, 12%), followed by students

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who accessed two planners (70 students – 11%). There were 45 students (6%) who accessed all 15 planners. The level of procrastination displayed by students seems to be in line with the lack of use of planers provided to students and is consistent with the findings by Elvers *et al*. (2003) who found that students do not use the planners provided.

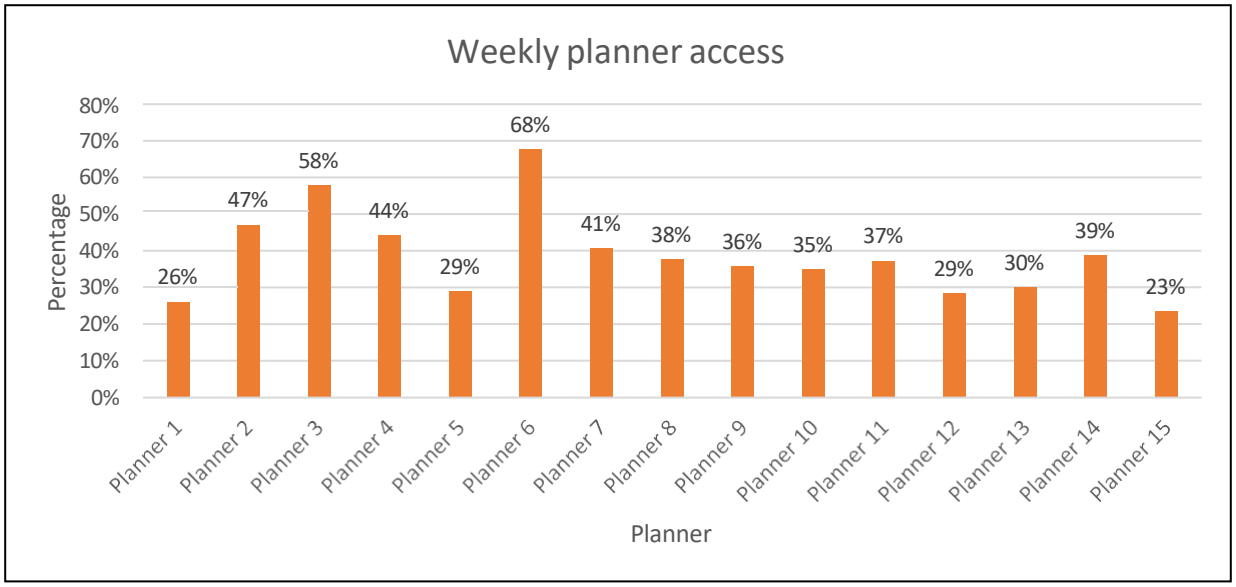

Figure 2: Weekly planner access

Overall access behaviour

Table 2 provides a breakdown of the number of students who did not access any of the resources. 59% of students did not access a single tutorial video that was uploaded. Given that tutorial videos are meant to explain the application of theory and substitute the traditional tutorial sessions, it is interesting as to why more than half of the students did not access this resource. Further, given that the tutorial content was provided to students to assist with learning, the reason for the low access would need to be investigated. Only 3% of students did not access any type of lecture material. It does appear that students consider lectures to be more important than tutorials.

ISBN NUMBER: 978-0-620-99843-7

Table 2: Number of students who did not access resources

Topics	Revision	Lecture Material	Lecture Videos	Tutorial Material	Tutorial Video	Self-Reflection	Extra Material
Number of students who did not access any resource from the category	48	21	113	114	416	113	68
Percentage -%	7%	3%	16%	16%	59%	16%	10%

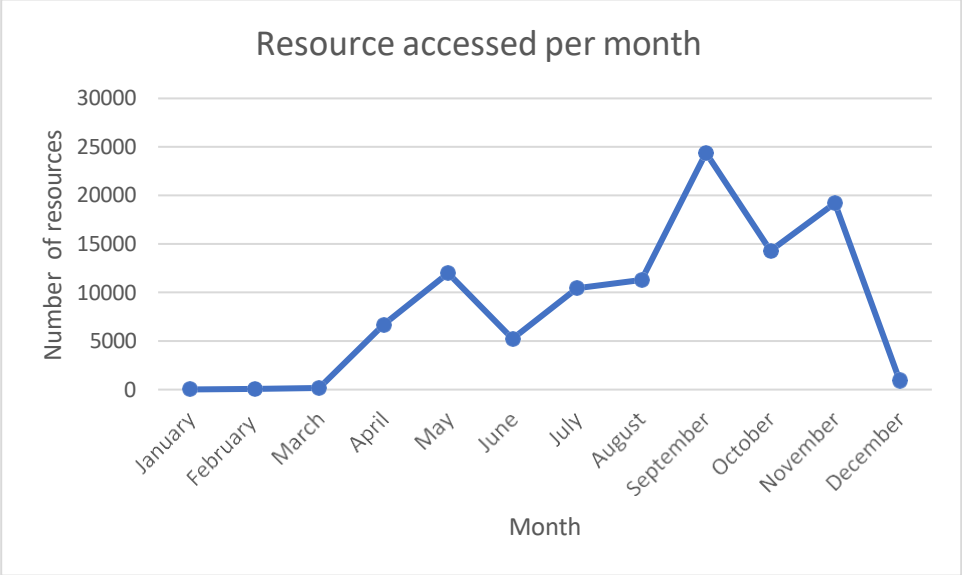

Figure 3: Resource access per month

Figure 3 provides the number of resources accessed per month. January to March is expected to be low as this was before the introduction of online learning which began in April. The spike in April can be expected as it is the first month that online learning was introduced. The other months where students' activity spiked are May, September, and November. Exams were written in June, as a result students used the month of May to catch-

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up on outstanding work. An assessment was written in September and there was a significant increase in resource access, this once again indicates that students may have procrastinated. After the test in September, students access decreased in October and increased again in November, due to the final assessments. This supports the notion that students do not work consistently and access resources closer to assessments (Elvers *et al*., 2003). This behaviour of students is in contrast with self-regulation and indicates a lack of time management and planning by students.

Time taken per online resource content

As there is a lecture every week, it would be expected that students access resources within seven days. There was not one student who accessed all resources seven days from being released. According to Table 3, only 14% of students accessed lecture videos within seven days. Only 2% of students accessed lecture and tutorial material within seven days. A larger number of students (38%) accessed self-reflection content within seven days. Given that self-reflection refers to exam feedback and students' solutions for exams, perhaps students access the information to understand the outcome of their test or exam.

Table 2 - Students who accessed resources within 7 days

Topics	Lecture Material	Lecture Videos	Tutorial Material	Tutorial Video	Revision	Self-reflection
Students who accessed resources in 7 days	15	98	13	63	23	267
Percentage - %	2%	14%	2%	9%	3%	38%

ISBN NUMBER: 978-0-620-99843-7

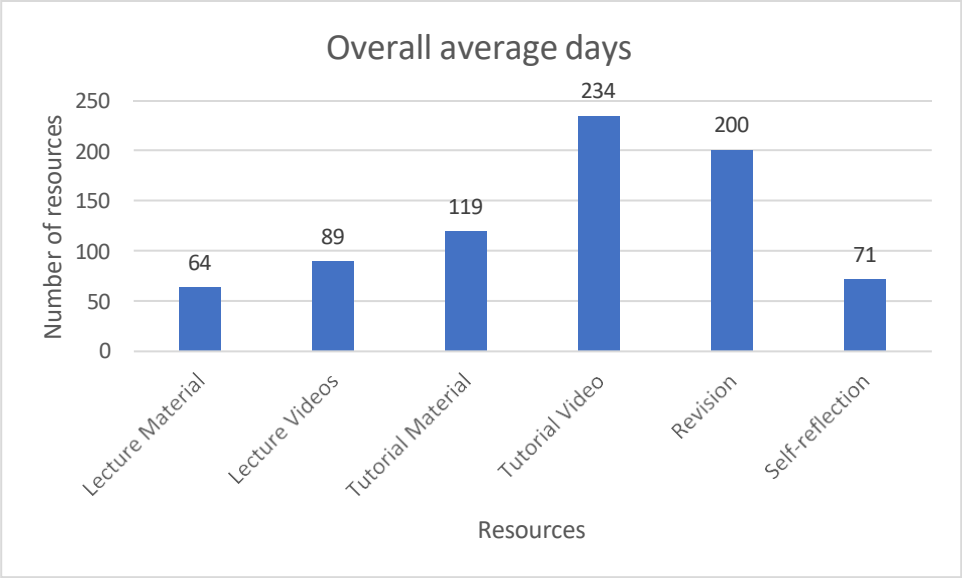

Figure 4 - Average days to access resources

Second year Auditing students took on average 130 days to access resources provided to them. This means that students are accessing resources close to four months after resources were released. Figure 4 provides an overview of the average day's students took to access resources. Students took the longest time to access tutorial videos (234 days). The average days to access lecture material is 64 days. The average number of days to access lecture videos is 89 days. This means that students are only covering course content close to three months later when compared to the scheduled time for the lecture. As students are covering course content so late, students are taking even longer to access the tutorial material. Students access the tutorial material on average after 119 days with the tutorial video accessed 234 days later. Second year Auditing students appear to procrastinate in terms of downloading resources provided to them. This is consistent with prior studies such as Visser *et al*. (2018), Elvers *et al*. (2003), Özer *et al*. (2009) and Solomon and Rothblum (1984) where procrastination has been found. Second year Auditing students lack self-regulation when it comes to time, as procrastination appeared across all resources. Given that students appear to procrastinate, the next section looks at the impact of procrastination on student's marks.

Association of procrastination on student mark's

Table 4 provides the average number of days that failing and passing students took to access resources. As discussed above all students appeared to engage in procrastination,

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both passing and failing students. But it seems that failing students took longer to access all resources and seemed to procrastinate to a larger degree when compared to passing students. On average failing students take 137 days to access all content, whereas passing students take on average 110 days to access all resources. Failing students seem to only access lecture material within a similar period when compared to passing students (difference of nine days). In terms of lecture videos, tutorial material, tutorial videos and revision, failing students took a month extra to access the course material when compared to students who passed. A Mann-Whitney U test revealed that there is a statistical difference between the average days that passing and failing students take to access resources (p = 0.000). Further, across all the resources provided the Mann-Whiteny U test indicated that there is a significant difference between the time to access resources (p< 0.01). The p-values for the different categories are shown in Table 4.

Table 3 - Average days for failing and passing students

Topic	**Failing - Average days**	**Passing - Average days**	***P*-value***
Lecture Material	65	56	**0.000**
Lecture Videos	102	67	**0.000**
Tutorial Material	129	94	**0.000**
Tutorial Video	245	214	**0.002**
Revision	212	176	**0.000**
Self-reflection	70	50	**0.002**
Overall average	**137**	**110**	**0.000**

* Significant at the 0.01 level

Based on the above it can be seen that procrastination by students does have a downward association on a student's overall mark. Table 5 considers whether procrastination has a negative association with a student's mark bracket. Based on the data, it appears that students who achieve higher marks tend to procrastinate less. It appears that when students procrastinate there is a negative association with the marks achieved. It can be concluded

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that not only does procrastination influence whether a student passes or fails it also has an association with the mark bracket students fell in. The earlier access of lecture material and lecture videos the more favourable the mark association is. As indicated in prior studies, when students procrastinate it increases the pressure on students to complete the work to the required quality and has a downward association on marks (Michinov *et al*., 2011).

Table 4: Mark association of procrastination on passing students.

Topic	**Average days**		
	50% - 59%	**60% - 69%**	**70% or more**
Lecture Material	58	54	45
Lecture Videos	75	61	36
Tutorial Material	107	83	68
Tutorial Video	217	215	218
Revision	186	173	124
Self-reflection	50	47	55
Overall average days	**115**	**105**	**91**

CONCLUSION

Given the unexpected shift to online learning caused by the COVID-19 pandemic, this research aims to provide an introductory view regarding the online behaviour of South African Accounting students. The results from the study are consistent with prior studies which indicate that students may have procrastinated when it comes to online learning with some students procrastinating learning to immediately before assessments. Second year Auditing students may have procrastinated accessing all resources provided to them during the online learning period. Students had abnormal spikes regarding access to online leaning resources in the days preceding test and exams. An issue that raises concerns relates to students accessing resources on the day of the final exam.

Given that resources were released every week, it would be expected that students access resources within 7 days. The average time taken by students to access resources is 130 days, indicating students may be procrastinating. Lecture material had the least procrastination, as content was accessed within 64 days. Consistent with prior studies

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procrastination was found to have a negative association with students' final marks. The longer students took to access lectures and tutorials the lower their final mark. There is a slight difference in passing and failing students, however students that accessed the content sooner tend to have a better mark for the course.

Given that this is the first-time that online learning has been fully introduced within the second year Auditing course, the study provides an analysis of certain self-regulation behaviour of university students within an online environment. The mark association of this behaviour can be used by educators to understand how students approach online course content to better facilitate learning. The findings can be used to adapt how online course material is presented and structured to students with the goal of reducing the access time to assist student in not falling behind on their studies. It can also be used to facilitate the process to assist students in becoming self-regulated.

As with any research there are limitations. The study does not investigate whether procrastination may be a result of limitation on access to information technology (IT) equipment and resources, IT skills, and students' home environment impacting on their ability to engage online. Additional research can be conducted to assess the factors that may lead to procrastination. The research is also limited in that it does not consider other reasons for students' non-access of resources such as the sharing of information across student groups. Further research can also consider students' perceptions of the content provided as this may provide insight into the reasons why students procrastinate and the reasons why some content is accessed, and other content is not. Research can also be conducted to investigate changes in students' behaviour across different years to assess the differences and similarities. This study however does provide an initial view of online behaviour within a South African context which provides a basis on which contact universities can improve on.

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